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ISAAC JAMES HARTFORD

AN ORIGINAL TREATISE

ON

ELECTRO-VITAL FORCE

BY

I. J. HARTFORD, B. S. D., D. O., M. D.

GIVING THE SOURCE OF VITAL FORCE AND ITS ACTION UPON BOTH THE ANIMAL AND VEGETABLE KINGDOMS; ITS ACTION IN PRODUCING THE VARIOUS SEASONS OF THE YEAR AND IN GIVING PERPETUAL MOVEMENT TO THE HEAVENLY SOLAR SYSTEMS AND THEIR RESPECTIVE SATELLITES.

GIVING THE MANNER OF PRODUCING LIGHT AND HEAT AND THE CAUSES THAT PRODUCE BOTH WINTER AND SUMMER UPON THE FACE OF THE EARTH AND OTHER PLANETS AS WELL; THE REASON WHY RAINFALL FOLLOWS THE PROGRESS OF CIVILIZATION UPON THE ARID LANDS OF OUR WESTERN COUNTRY AND HOW TO INCREASE THE MOISTURE AND PRECIPITATION OF RAINFALL OVER ARID DISTRICTS.

PUBLISHED BY THE AUTHOR
AT
PAXTON, ILLINOIS

THIS BOOK IS DEDICATED TO THE MEMORY OF MY PARENTS

To my Father for his training in the elements of true citizenship and for his unceasing opposition to all forms of rowdyism, vice and all those elements that degrade the business integrity and the true morals of mankind.

To my mother, who died when I was but six and one-half years old, for early Christian teaching concerning God, Christ, heaven and the life beyond. It was my mother who first taught me to reason in numbers and caused my mind to wonder until confused and mystified concerning the mysteries of creation. The thoughts of my mother still remain in my memory as a personification of kindness and of patient devotion and hard service to her children, to her husband, to the duties of her household and of humble reverence to God.

THE AUTHOR.

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PREFACE.

It has appeared to the writer that the proper method in the study of the human body and its relation to health and disease is not to study the constituents of the body alone, but also to study the forces necessary to enable the body to take hold of and assimilate the various food and vital elements that supply the body and the conditions necessary for such elements to become a part of the body, assisting in the production of the various phenomena of vital activities and bodily action. It has not been the aim of the writer to bring into prominence the elements of which a tissue or organ may be composed, so much as to make prominent the conditions necessary for any tissue or organ to act, assimilate, perform its function and assist in all the various phenomena peculiar to normal vital action.

For information regarding the cell and the tissues of the body the writer is indebted to various text books, as Kirk's Physiology, Gray's Anatomy and various other text books containing information on various subjects.

In astronomy the author has secured data from Olmsted, Newcomb, Holden and others.

But the peculiar application of this information and for numerous assumptions and observations leading to various conclusions that the author has made as well as the discovery of the application of what the author has termed an Electro-Vital Force must be attributed to an intuition prompted by an unseen yet ever present intelligence that leadeth the human mind that is prone to investigate and explore the realm of truth, while leaving behind obstacles of socalled authorities on allied or kindred subjects. The mind thus released is free to investigate and make such application of truths found as may be verified by the application of truth to natural phenomena and confirmed by reason in the field of nature.

The discovery of the application of this electro-vital force to the movements of planetary bodies was indeed a great surprise to the mind of the author. The thought that gave to the mind the discovery and application of this force was accompanied with a consciousness that the mind had reached a kindred realm where a great truth was being revealed as the conception of the writer began to unfold the application of this truth and verify the same with natural phenomena as constantly experienced in the realm of nature about us. So impressed with the truthfulness of the existence and application of this force was the author that at no time since that moment has he had reason to doubt its authenticity. In this work the author has permitted his mind to be led, recording the impressions as they have been slowly revealed to his mind; yet at times questions have arisen, that for the time have been seemingly unsurmountable, yet at no time under such apparent darkness and unsurmountable difficulties has the faith of the author wavered in his belief that a great truth had dawned upon his mind. The first great obstacle appeared when the author was led to give, in his explanation by the application of electro-vital force, a valid reason why the earth swings nearer the sun at the time of her perihelion than she does at the time of her aphelion. That problem required at least two weeks hard study before the author discovered the reason.

The author feels the deepest reverence and gratitude for the guiding presence of the spirit of Almighty God whom the author feels has opened the paths of truth revealing much truth that the author was and had been ignorant of its existence until such truth became apparent in the aplication of this force in nature. The author has permitted his mind to be led and whatever of truth he has been led to discover, the credit for which, belongs to the guidance of Almighty God rather than to the natural abilities of the author.

The reader will doubtless observe that the author apparently repeats the same thought throughout various portions of this work. While the author is aware that this work may abound in iteration to the point in various instances of reiteration, yet he has knowingly permitted this to occur for the sake of clearness of understanding on the part of the reader; feeling that if this were done the reader would not be required to reread former portions of the work where the application of a principle and the views of the writer regarding certain principles and phenomena were not well understood by the reader.

The author has repeated his views and certain principles feeling that while he would thereby give the reader a clearer understanding of the idea that the author wished to convey, he would also impress the principle more deeply upon the understanding of the reader by such repetition of the principle in giving such principle a new application in the realm of natural phenomena and in so doing the author would secure on the part of the reader a very important essential to clearness of understanding and a more vivid and lasting impression upon the memory of the reader. In this the author has but fulfilled what Gregory has claimed to be an essential requirement, "Repeat, repeat, repeat," to firmly impress the thought upon the memory of the reader or pupil.

While the author may be criticised for various rhetorical defects and for deficiency in rhetorical beauty and sublimity in expression, and the criticism of tautology may be placed against him in this work, yet he has written this work not with a view to pleasing the public nor the reader, but rather to express the truth as he sees it in his own plain blunt way, feeling that the babble or praise of the multitude as well as the self-constituted elite, are but nothing and that the world and the professedly learned have often lauded error while they have trampled under foot the pearls of truth, only in some future day to awaken to their folly; so the author feels that he can bear whatever criticism may be heaped upon him in this work, having that consciousness to sustain him that he has written as truth has appeared to him not for the sake of the weak and worthless praise of men, but for the sake of presenting a truth that will stand for the ages, when his poor body and this generation of mortal beings shall have returned back to mother earth.

It is with the sincere hope that those who read this book will be led to feel that God is ever present and that His forces enter into all forms of life upon earth and dominate the every movement of planetary bodies, that His protection and care ever sustains us and every living creature throughout the realms of nature, that for us to close our understanding to the voice of nature and for us to refuse life and cultivation where life and cultivation are possible in bringing ourselves and mankind in general to a higher development and attainment in this life is an overt sin against God and His plan to people the earth and to bring mankind to the highest state of physical, mental and moral cultivation, whereby the understanding is brought to an enlarged comprehension of God's purpose in nature, as everywhere abounding in evidence through nature's expression concerning God's good-will to those who obey nature's laws, keeping within the bounds of moderation to their natural purpose and falling short of their abuse in the enjoyment thereof; to the end that mankind may enjoy in a physical state the highest blessings of God, whereby mankind ennobled with a strong and perfect physique, a strong mentality with wide, vivid and generous comprehension, a nature sweetened and refined with a moral gentleness and perfection that betokens the perfecting element of God's love as the dominating element in every creature. To such an ideal state it has pleased God to give mankind the elements and powers to attain, maintain and enjoy, through the assistance of God's spirit to the subjugation of the baser and the cultivation of the higher elements of our being.

In the final preparation of the drawings in this work, excepting two, the author acknowledges very able assistance from William Glenn, at present a student in the University of Illinois at Urbana, Illinois.

Isaac James Hartford.

Paxton, Illinois, October 31st, 1907.

CHAPTER I.

THE ANIMAL CELL AND THE REQUISITES NECESSARY TO VITAL ACTION.

In the study of the prime elements of the human body we find it composed of various tissues and each tissue is composed of cells. Each cell is capable or does at some period of its existence, give evidence of vital action. This action may be a part of some bodily function, or it may be a reproduction of the cell and the building of new tissue, or it may be imparting to the vital fluids of the body some constituent or force, capable of assisting the metabolism or the action of some other tissue or tissues.

The cells composing the tissues of the human body vary in size from 1-300 to 1-3000 of an inch in diameter. A cell contains a substance called protoplasm, which constitutes the greater portion of the cell. The protoplasm contains usually near its center a small vesicular body called the nucleus. Another smaller body floating within the protoplasm, found usually near the nucleus, has been called the attraction sphere. The higher power microscopes reveal in most cells a network or spongelike substance within the protoplasm and a more fluid portion capable of flowing between the meshes of the spongework. The spongework has been named the reticulum or spongioplasm, while the fluid portion has been designated the enchylema or hyaloplasm. The spongioplasm is only slightly more solid than the hyaloplasm. It will be seen that the cell is thus capable of changing its form by simply drawing the spongioplasm closer together, forcing the hyaloplasm from between its meshes, thus diminishing the thickness of the cell while its length is correspondingly increased. By reversing or relaxing the tonicity of the spongioplasm the hyaloplasm is again drawn into the meshes of the spongioplasm, and the cell becomes thicker and shorter. This is a simple illustration of the phenomenon of vital action and how cell motion is capable of being produced.

Chemically, protoplasm is composed of about three parts water to one of proteids, water being composed of two atoms of hydrogen to one of oxygen. Proteids are albuminous substances, consisting chemically of hydrogen, nitrogen, oxygen, sulphur, and phosphorous found only in very small quantities, phosphorous being more abundant in the nuclei of cells. Most proteids coagulate under the influence of heat. The great proportion of water in protoplasm and the tendency of the proteids to coagulate under the influence of heat, leads us to observe the great necessity of an abundance of water supplied to the body, and of not allowing the body to remain at a high temperature for any great length of time during fevers, as a failure to observe either may lead to a great destruction and consequent loss of vital tissues within the body.

THE CELL NUCLEUS.

Usually there is but one nucleus within a cell, yet there is often more than one. The nucleus is either round or oval, often of irregular shape. The nucleus consists of four parts, first, the nucleus membrane, second, a network of fibres very much resembling the spongioplasm contained in the protoplasm. This network is called the chromoplasm and is of coarser structure than the spongioplasm; third, a nuclear sap which fills the meshes of the chromoplasm and corresponds to the hyaloplasm of the protoplasm; fourth, nucleoli, which are of two varieties, one consisting of knots along the fibres of the chromoplasm and the other of knots floating freely within the nuclear sap. The nucleus appears to exert a controlling influence over the nutrition of the cell; any portion not in communication with the cell nucleus soon indicates that it is being deprived of nutrition and soon undergoes degenerative changes.

THE ATTRACTION SPHERE.

Most, if not all, living cells contain in addition to protoplasm and a nucleus, an attraction sphere. The attraction sphere appears as a very minute particle having an apparently attractive influence on the protoplasmic granules that radiate from it. It is more particularly prominent in embryonic cells that are about to divide when it becomes double. It is supposed that the attraction sphere takes the lead in cell division, the nucleus and cell protoplasm following.

PROPERTIES OF THE LIVING CELL.

The living cell has the power; 1st, of movement, as ciliary movement, movement of the white corpuscle, power to increase its length and diminish its breadth or to increase its breadth and diminish its length alternately, giving rise to various forms of motion; 2nd, power of assimilation, as the power to grasp and devour substances converting them into its own substance, also the power to breathe or take in oxygen which is essential to the life of the cell; 3rd, power of growth as the development preparatory to cell division; 4th, power of reproduction, as the division of the attraction sphere, the nucleus and cell protoplasm to form new cells, which in turn are capable of again dividing and producing new cells, the process being indefinitely repeated; 5th, power of excretion, as the power to throw off its own refuse changed by metabolic processes within the cell.

AGENTS INFLUENCING THE VITALITY OF CELLS.

1st, Change of temperature: Protoplasmic movement ceases below 32°F., while a temperature below the freezing point stops the movement of protoplasm, yet it does not altogether kill the protoplasm, and if soon raised above the freezing point, the protoplasm may be revived and become active in proportion to its temperature limits. Heat prolonged for any extended length of time above a temperature of 104°F. altogether kills the protoplasm, rendering it incapable of being revived. Plotoplasmic movement increases in activity from the freezing point to about 98 6-10°F. the natural temperature of the body, to 100°F. Mild forms of heat thus acts as a protoplasmic stimulant. A temperature of 104°F. is sufficient to coagulate the proteids of the protoplasm, causing them to assume a condition of heat rigor, already noted, a condition possibly causing the expansion of the cell nucleus to a point of bursting its cell membrane or disarranging its parts, destroying its function, and thus destroying its nutritive power over the cell, causing degenerative changes to set up and permanent destruction of the life of the cell.

The influence of temperature over cell activity and its influence upon cell life cannot be too closely kept in mind, that its dangers may be averted in all cases of extreme temperatures of the body.

2nd, Mild chemical stimuli, as dilute salt solution, temporarially stimulates the protoplasm and promotes cell action, hence its influence over the heart and the circulatory system in cases where the heart has weakened or apparently stopped action, as in sudden hemorrhages; also its influence over the glandular system is shown in generally increasing the secretions; also in cases of constipation it acts upon the mucous linings of the alimentary canal, stimulating the various glands and cells and augumenting their action along the entire canal. It must be noted that long continued excessive use of common salt has a deleterious influence over the kidneys, hence its continued use must be guarded within the lines of safety. The influence of mild chemical stimuli is shown in various drugs used, as mild cathartics in order to induce action along the alimentary canal.

3, Dilute alaklis stimulate the action of protoplasm temporarily.

4, Strong acids or strong alkalis produce the immediate death of the cell. This fact must be borne in mind when using strong drugs as caustics or internally. The writer has seen cases in which it appeared to him, that more damage to the tissues had been done by the use of strong antiseptic drugs than by the disease. If one would just stop to think of the effect they undoubtedly would be more careful in the use of strong drugs. In the use of strong germicides the object is of course to destroy the germs, but a strong germicide goes farther and destroys the tissues against which it comes in contact, not only a destruction of germs, but the destruction of the very essentials that you wish to save and rebuild are so included, that of the cells and tissues. Many, I think rightfully, claim that the use of germicides unless under extraordinary circumstances, where their immediate destruction is required, should be confined not so much to the destruction of the germs as to the inhibition of their growth and reproduction. As the life of the germ is but short, varying from a few hours to, in extreme limits, but a few days at most, their reproduction and growth should be prevented, which can be done with the use of cold applications and mild germicides not sufficiently strong to seriously affect the reproduction of the tissues. In such a procedure the reproduction of the germs is prevented, and if care is properly used the question of their existence is but a few days at most. The parts can be kept aseptically cleansed and the reproduction of new cells to replace the eroded tissues encouraged, which appears to the writer the better plan, a thoughtless, happy-go-lucky mode of procedure in which apparently no thought of the action of the drug used upon the life of the cells composing the tissues is entertained, but a wholesome killing of germs and tissues as well is done by strong drugs used, seems inconsistent with the object in view, that of both destroying the germs and replacing dead and eroded tissues with the growth of new tissues, when but a little thought will convince one that such a procedure, while it kills the germs, also kills the tissues and increases the sloughing of the dead tissues, so killed by the use of strong drugs, rather than by the germs present.

5, Protoplasmic movement is suspended in an atmosphere of hydrogen or carbonic acid gas, but if the cell is completely deprived of oxygen, after a time the cell with its protoplasm dies for want of oxygen. It appears that the deleterious effects of carbonic acid gas arise from their ability to dilute the oxygen or deprive the tissues of oxygen and that the suspension of cell activity, after a while followed by the death of the cell, is produced more from the want of oxygen than from any deleterious chemical effects that the atmosphere of hydrogen or carbonic acid gas may have upon the life of the cell with its contained protoplasm. This fact teaches us that oxygen is absolutely essential to cell life, a fact that must be constantly borne in mind and its importance regarded with the utmost care in the consideration and treatment of all affections involving the activity and life of the various tissues composing all or any part of the human body.

6, Electricity in weak currents stimulates protoplasmic movements, while strong electrical currents cause the cells to assume a state of tetanus and remain motionless. These facts must be carefully guarded in all cases involving the use of electricity. A very mild use of electricity may in some cases, if kept within certain limits, become beneficial, but a careless use of electricity without great and intelligent regard to the true condition and vital states of the various parts affected, may become very injurious if not destructive, to cell life. It must be kept in mind that in every action involving the tissues, that there are certain products arising from such action that become waste matter and must be thrown off or carried away through the medium of the lymphatics or else the tissues with their constituent cells will soon become surrounded with a zone of waste matter that becomes an insulation to prevent the vital elements of the blood from reaching the cells to revivify and replenish their various requirements. This zone may be the metabolic products of the cells and it may be intensified by the products of muscular action as sarcolactic acid, which in actions involving the movements of the muscles, becomes very abundant, giving rise to feeling of fatigue, a gradual weakening of muscular power and, if sufficiently prolonged, an absolute loss of power and muscular motion. Persons and animals unused to much muscular exercise are often killed by a sudden unusual exertion of their muscles, as in running or prolonged muscular exercise, usually classed as heart failure, which in a certain sense is true. But what causes the heart to fail under such circumstances? Is the question to be considered by those not satisfied with a superficial view of things, and who desire to know the real philosophy, the dominating cause producing the effect. As was stated under topic five, in the consideration of protoplasmic movements, that oxygen is absolutely essential to cell life and that any deleterious or waste matter tending to insulate oxygen from reaching the cells composing the tissues causes a stoppage of their action and finally, if prolonged, the death of the cells. Another fact must be taken in mind. It is found that when cell activity is carried on or artificially produced under an insufficient supply of oxygen, which could be the case in a weakened condition of the system when cell action is artificially produced by electricity, that the activities of the body is productive of carbon monoxid, there being an unsufficiency of oxygen present to produce carbon dioxid, the diad instead of the tetrad action taking place instead of the usual combination of carbon and oxygen in the form of carbon dioxid as is common in the metabolic processes of the body. Carbon monoxid has an unsatisfied valency on the part of the oxygen atom, hence it unites with the remaining oxygen contained in the haemoglobin of the blood, which it does so firmly as to absorb the oxygen within the haemoglobin, thus depleting the oxygen within the red corpuscles, produces death of the vital principle contained within the red corpuscles of the blood; hence the red corpuscles lose their vitality and the haemoglobin of the blood through death of the red corpuscle is rendered incapable of taking on more oxygen, or rather of replenishing the blood with new oxygen in its passage through the lungs. Thus a superabundance of sarcolactic acid being suddenly produced by a sudden unusual action of the muscles, combining with the usual metabolic processes of the body, tends to throw the balance in favor of a superabundance of the carbon products within the blood, suddenly producing a condition of rendering the blood incapable of reoxidation and of further performing its normal function, as just stated. The capacity of the lungs in a reduced state of vitality often insufficient to properly oxidize and produce a working action requisite for the required supply of the body, upon such blood as may not be otherwise sufficiently rendered incapable of performing its normal function, thus tending to further enhance the condition of filling the blood more full of carbon products until it has reached that limit of containing such a supply of blood rendered useless by its contained carbon monoxid, that the oxygen within the blood is no longer sufficient to maintain cell action, hence muscular action within the vascular system can be no longer maintained, and the heart muscle consequently ceases action, thus producing instant death.

We have just considered the extreme limit to which the evil effects of an unwarranted use of the muscular and bodily exercise of the body may be carried, while the death point may not be reached in every instance, yet one may reach a state nearing that limit before they are aware. It therefore behooves any one who undertakes any treatment, such as electricity, or any system of exercises wherein the muscles are caused to contract and relax alternately, to use much judgment and care, the tendency of such action being to increase the metabolic and muscular products and of suddenly throwing such waste products into the blood. While one may claim that a mild form of electricity does not produce such action, one must not think that simply because they cannot see or appreciate any perceivable muscular action, that such action does not exist. The contractions may not be perceptible, but nevertheless could we perceive all the numerous minute actions upon the various muscles, striated or unstriated, we would be convinced that there is much, even minute, muscular action even in mild forms of electricity. Exercises wherein the muscles are worked, kneaded, etc., while in a passive state does not tend to produce muscular action and thus produce sarcolactic acid waste, consequently is unfatigueing and not inclined to add to the already accumulated waste matters of the system, but rather to assist in the removal of the already contained waste matter, obtaining the excretory effects of muscular movements without adding to the waste matter present, thus obviating fatigue through muscular exercise and the consequent loss of the contained energy within the muscle tissues and nervous systems. Yet there is a danger limit even in such manipulations and exercises providing the patient is not accustomed to such treatment or even if accustomed to such treatment, yet allows quite an interval to intervene between treatments until the lymphatics and tissues are well laden with waste matter, then by suddenly unloading an over supply of waste matter into the blood, thus consuming the oxygen present, without giving the blood sufficient time to dispose of such waste matter and properly reoxydize the blood, thus the tendency to produce a condition of suboxidation, giving rise to heart failure, which is enhanced and such condition approached to that degree that the blood may be laden with more waste matter than it can properly dispose of at such times, hence vescular and heart failure from suboxidation. Thus it becomes necessary to use much care and judgment in beginning any treatment, tending to unload the waste matter within the tissues into the blood stream. A very mild treatment of electricity may often be beneficial providing the system is not in such an exhausted state wherein a slight degree of muscular contraction does not use too great degree of the latent energy of the body, but if the body is so weakened that even a slight expenditure of the bodily energies carries the limit below that required to maintain bodily metabolism, thus tending to exhaust the vital force required to maintain the nutritive processes and requirements of the body, then such treatment becomes decidedly detrimental. Not so with such manipulations and bodily movements that do not tend to exhaust the vital energies already present, but while they tend to assist the tissues to throw off their waste matter, they also tend to enhance the circulation of the blood and thus bring the vital elements necessary to revitalize the cells composing the vital principle of the tissues and thus refunctionize every portion of the body so influenced, judgment being required not to throw too much waste matter suddenly into the blood, but by gradual degrees, although a longer period may be required to rid the system and tissues of its waste matter, hence not too energetic and rather light treatments in beginning a series of treatments is the better and safer plan, it being remembered that such treatments be kept sufficiently light to be within reasonable bounds of heart safety, yet not carried to the extreme of being so light as to be almost if not entirely without benefit to the patient. While an over zealous practitioner who is anxious to give the most possible for his money and to do all the good possible for the welfare of the patient, is very liable to go to the extreme of giving too heavy treatments to his patients, on the other hand the lazy unscrupulous practitioner who cares more for his lazy self than he does for the welfare of his patient is very liable to go to the other extreme and to give his patient such light treatments as to be almost, if not entirely, useless to the patient. Such is not always considered robbery, but it comes so near to it that it often takes the patient's money without returning to him any material benefit and is apt to disgust the patient with the treatment and bring the system and its worthy practitioners into disrepute in the esteem of the patient and others in sympathy with such patient.

What has been previously said must not be inferred as ignoring the good effects of bodily exercise when the patient is of sufficient strength to take bodily open air exercise, stopping short of a limited degree of fatigue. In the writer's opinion there is no exercise that will equal walking to induce a better oxidation of the blood from increased systematic inhalations of pure open air and its consequent good effects upon the lungs and all vital tissues; yet bodily exercise, while it should be practiced in the form of walking, light forms of labor, etc., often can not be taken and granting that the patient is of sufficient strength to endure even a limited degree of bodily exercise, his store of strength is soon exhausted without blood being impelled to the remote vital centers and neurones, giving them that revivifying element of the blood they are so much in need of obtaining, then too, those vital centers may be surrounded with deleterious matter, the lymphatic system probably overworked or in a sense obstructed and prevented from lack of sufficient vitality or possibly loaded beyond its strength with waste matter forming a blockade of such matter within the tissues thus preventing the entrance of the vital elements in the blood from reaching the neurones of both the brain and the spinal cord as well as the vital elements of the cells within the tissues. So it is that bodily manipulation can be applied and made go further and to do a work that is impossible to do under the conditions that often exist, tending to handicap the good effects of bodily exercise in the form of walking, etc.

The good effects of all manipulations of the body are due: first, to the simple fact that the circulation of the lymphatic system is increased and the tissues are better cleansed of their waste deleterious matter, such as the natural products from the metabolism of the body, exercise and such waste products as may result from the diseased organs and tissues and the presence within the system of disease germs and their consequent toxines, ptomaines, etc.; second, that the circulation of the blood to diseased parts is enhanced and greatly increased, thus while the lymphatic system is induced and assisted through bodily manipulation to more thoroughly cleanse the tissues of waste matter, and the tissues are released from devitalizing obstructions, the blood is permitted to flow unobstructed throughout the tissues and revitalize the various cell elements found throughout the various tissues, more particularly felt in the revivification of vital centers, the sympathetic nervous system and the various neurones of the brain and spinal cord. The vital elements as the contained oxygen within the hemoglobin and other nutritive elements contained within the blood, that are necessary to refunctionize the constituent cells of the various tissues of the body, are brought directly to the depleted cells giving them renewed life and strength. We are here confronted with this fact that we have the cell to deal with and upon its action depends the good effects that we endeavor to have take place in restoring the body to its normal state of health and strength, all depends upon how the cell shall receive such nutrition as may be brought to it through the blood stream or possibly more properly speaking shall reach it through the osmosis of the nutritive elements carried near or in juxtaposition to it by the arterial system and contained within the blood. If the cell is found sapped of its strength and completely exhausted it is near the death point and possibly will not be able to even exert sufficient inherent strength if contained to exert and fulfill its own metabolic processes in order that it may utilize the revitalizing elements now surrounding it. If it has the inherent force sufficient to enable it to reach out and absorb and utilize the nutritive elements thus furnished, it is possible that it may be revived and enabled to again perform its normal function and thus exert its influence and aid in the general revitalization of the body, but if such cells have reached that point of exhaustion wherein they are no longer able to absorb and utilize the nourishment thus given, the cell nuclei will be surrounded with a zone of dying protoplasm that too will become an effectual insulation to prevent the nutritive elements surrounding them from reaching the cell nuclei and they too thus robbed of nutrition must die which completes the death of the cells. It is thus that cells often die and nuerones and nerve centers and vital parts are thus depleted until their function is impaired and gradually weakened until finally lost.

7. Protoplasmic movements are induced and increased by gentle pressure. Thus it is that the inherent strength of the cell protoplasm is induced to greater activity, all cells throughout the parts being thus effected, through deep but gentle thorough kneadings and other proper manipulations of affected parts. Thus it is that bodily manipulation intelligently given becomes so efficient in restoring lost functions and in revitalizing the entire body. It must be borne in mind that no good effects can follow to such cells as may have reached that point wherein they are no longer able to utilize the vitalizing influences and advantages thus afforded, in fact there is no treatment that can benefit cells having reached such a state of vital weakness. It is thus that any one may assist another through intelligent manipulations of the body, the benefit being derived through the changed conditions surrounding the cells and the increased cell activities thus induced rather than to any healing virtue within or on the part of the manipulator.

8. Contact with foreign bodies increases protoplasmic movements. Thus it is that such foods as form much excreta as coarse foods, become a stimulant to the various cells along the alimentary canal, serving to arouse the protoplasm from a torpid action in the various cells along that channel. It is thus that the filling of the bowel with food stimulates

peristaltic movements and the natural filling of the colon induces acts of defecation or a filling of the colon with water or any foreign substance induces an expulsion of the bowel contents through the reflex arc of the subsidiary cerebro-spinal centers. The same may be said of the action of the bladder, the uterus, the touching of the fauces inducing spasmodic action of the glottis, foreign bodies within the trachea inducing expulsive acts of coughing, and so on, the principle holds good.

CELL DIVISION.

Cells multiply by division. It is supposed that division begins at the attraction sphere. The attraction sphere dividing into two parts, each part drawing off a portion of the cell nucleus and a portion of the protoplasm contained in the original cell, the parts thus divided become individual cells capable of repeating the multiplication by division, following the same order as followed by the original parent cell.

(The foregoing discussion of the cell was written as a beginning chapter of a physiology of the human body, written by the writer, of which the following discussion concerning the source of vital force was intended to become the concluding chapter. For certain reasons the writer has concluded to omit the intervening chapters of his physiology at this time and possibly publish that portion at a later period. It being the object of the writer to impress the reader with the great importance of the source and action of this great electro-vital force pervading the universe which becomes the essential element in all forms of vital action.)

We have learned that oxygen is absolutely essential to all forms of life and that without oxygen the constituent cells of every tissue composing the individual will very soon die. It has been found that on descending into excavations, where for any reason the contained atmosphere has lost its life sustaining powers and gases have taken the place of such vital elements, that any person on breathing this devitalized atmosphere is instantly paralyzed, that is the cells and muscles instantly lose their power of action, respiration and heart action cease and death immediately ensues. This vital exhaustion and death is due to the failure of the hemoglobin of the blood to receive its vital supply from the atmosphere breathed and transmitted through the air cells of the lungs to the blood, which in turn does not supply the living cells and tissues within and constituting the walls of the heart and arteries with sufficient vital force to induce contractions of the muscular fibers composing the walls of the heart and arteries, consequently vascular action ceases and death immediately ensues. So with all cells composing the body, if deprived of sufficient oxygen, their vital powers wane in proportion to the diminution in the necessary supply of oxygen; hence it is in disease, where for any reason the excretory powers of the body lag in vital action, the tissues become filled with toxic products from failure to properly eliminate the waste products resulting from cell and tissue action; the lymphatic system, by long continued strain and overwork and possibly insufficiently vitalized becomes unable to perform its proper function, leaving the lymphatic vessels and glands engorged with effete products from the vital cells and tissues; the drainage from the bodily cells of the products of vital activities becoming thus checked, the vital cells throughout the body soon become surrounded with effete products of their own excretions during vital activities, thus forming a zone of devitalized matter around the vital cells, thus bathing the cells, as it were, in their own excretions that serve not only as toxic products surrounding the cells but in addition become an obstacle to prevent the ingress of new blood necessary to sustain and revitalize the parts and furthermore serves to insulate the vital current and thus destroy the function of such vital parts.

Hence all bodily cells composing the elementary tissues of the body, whether of muscular tissue or of bone tissue or of nerve tissue or of epithelial tissue are compelled to breathe over and over from their own effete matter consuming and gradually diminishing the contained oxygen supply and as gradually waning in their inherent vitality and power by a gradual decline until finally when entirely deprived of the vital element in oxygen the cell nucleus dies never to be revived again. But if before death of the cell nucleus occurs fresh oxygen be supplied to the cells the cell nuclei are capable of being revived and of regaining their responsiveness to stimuli from the nervous systems and in so doing reestablishing the vital current to such tissues and cells whereby the life and activities of such cells and tissues may be renewed and their respective functions reestablished and maintained.

Thus it is, when during the course of waning vital powers, from disease, old age, overwork or from bodily abuses and dissipating excesses, the vital powers become reduced and unable to properly cleanse the systems of accumulating waste matter until the tissues become clogged with effete products resulting in further bodily weakness and in disease and death of the constituent cells and tissues of the body.

To relieve such disease producing bodily conditions is the purpose of intelligent manipulations of the human body. It is thus that scientific bodily manipulations have become such a boon to suffering humanity in restoring the body from a condition of suffocating vital cells and tissues with its consequent waning vital force to a state of bodily health and vigor as a consequence of removing such pathological states through proper release of obstructed vital channels and reestablishing the flow of vital fluids and the vital current of the body with its consequent refunctionization of diseased organs and vital centers. Thus the writer would impress upon the reader—that it is through the proper release of vital stagnations surrounding and throughout all vital cells and tissues of the body, whereby the proper elimination of all waste matter is promoted, the lymphatic system is induced to resume and fulfill its proper function, the tissues are thereby cleansed of their impurities and the blood supply is reestablished bringing its nutrition and vital energy to the cells and tissues enabling the cells to receive and maintain the vital current of the body and in so doing promote and maintain the function of each part, whereby vital cells and tissues are renewed, vital force is gleaned from the blood and stored within both tissues and cells and the cells of nerve tissues and nerve centers, thus promoting the bodily vigor by the filling of all bodily tissues and especially the dynamic centers with both the solar and the terrestrial vital forces to supply the virility of the individual whereby all the bodily processes and all the various phenomena of life are constantly renewed and maintained throughout life, that health is regained and maintained.

THE VITAL ELEMENT WITHIN THE ATMOSPHERE.

During such periods as when both the earth and sun are in a reciprocal state, as will be hereinafter explained, over such portion of the earth where your observation may take place, if air be inclosed in a tight room for a short time, such air soon becomes stale and unfit to be breathed and produces a feeling of suffocation on being breathed proving that it has lost its vitalizing power, proving that the vital element that it once possessed has weakened in vital efficiency; or if during such period the earth after a hard rain or during rainy weather should over such portion become enveloped with clouds or the atmosphere become filled almost to the point of saturation with moisture, the air on being breathed appears to have lost in life sustaining power, proving that the atmosphere in such places of the earth under observation has become depleted in its vital or life sustaining qualities and has become incapable of imparting that vitality to the body that it once possessed. Such vital depletion is due to the contained vital solar energy becoming depleted by solar insulation and by neutralization through union with electrical emanations from the earth, which by uniting with the contained solar energy associated and in chemical union with the oxygen atom so depletes the contained solar vital energy until the effect is quite perceptible if not fatal to animal life. Such air becomes stifling, producing a feeling of suffocation on being breathed, thus proving that it has lost its power to satisfy the demands of the body for pure vitalizing oxygen energy. Thus although the oxygen may remain in the molecule of air, yet its vital power becomes depleted when subjected to being neutralized by emanations from the earth's electricity, as will be hereinafter explained. It is the opinion of the writer that the energizing force of the atmosphere is not so much due to the energy of the oxygen atom alone, as it is to the electro-vital energizing property associated with the oxygen atom that gives to oxygen its life sustaining power. Rather it is that readiness with which oxygen unites with other elements that gives to oxygen the property to take hold of this electro-vital solar energy and hold it in chemical combination, possibly chemically undetected, to be freed on coming in contact with the hemoglobin of the blood, by means of which it is carried and imparted to the tissue cells. It is known that oxygen possesses the property of uniting with every other known element, except flourin. This property to break combinations and readily unite with other elements may give to oxygen this power to readily unite with the solar energy imparted to the atmosphere by the sun's rays and as readily released on coming in contact with the hemoglobin of the blood, or rather possibly carried to the capillaries and there by a greater affinity within the tissue cells this solar energy is freed and imparted to the nuclei or other portions of the cells and tissues. This solar energy is an unseen electric vital force or a vital force laden with various forms of energy capable of imparting energy to various forms of life existing upon the earth. This energy accumulates and produces a surplus vital energy in that zone of equalization between the electricity of the earth and sun. The atmosphere of the earth occupies this zone and most naturally accumulates this energy in such space where it unites with the oxygen atom to be breathed by various forms of life upon the earth. Possibly this energy is free ozone or possibly free oxygen emanating from the sun and uniting with nitrogen gas from the earth and earthy productions forms air suitable for being breathed by living forms and sustaining life upon the earth. Which we do not know, but we do know that life is absolutely dependent upon oxygen, or the vital energy associated with oxygen, for existence in a material state.

Oxygen having the property of readily forming combinations with other elements, the gaseous state being the most suitable form for forming such combinations, the oxygen of the atmoshpere thus readily takes on and enters into combination with this solar vital force that accumulates in the atmosphere where the solar and terrestrial electrical forces unite, the residual solar vital energy entering into combination with oxygen is carried with oxygen to the lungs, possibly chemically undetected, where this solar vital energy enters the hemoglobin of the blood on being breathed, where it remains possibly electrically insulated in the hemoglobin until liberated on comiing in contact with living cells and tissues having an affinity for this electro-vital force as gleaned from the vital rays emanating from the sun. Doubtless the surplus energy becomes stored as free energy within the cells and nerve elements, composing the various ganglia of the nervous systems. In fact every living cell within every tissue of the body, wherever the blood is carried, partakes of this energy to a sufficiency, providing this energy may be present in sufficient amount, then allowing the blood to pass on to other cells and tissues alike imparting vital energy to them. Thus the blood is being constantly depleted of its vital energy all the while the blood is coursing its way throughout the body, when it is returned to the lungs for a renewal of this solar vital energy thus exhausted from the hemoglobin.

One may find convincing proof of how essential are the sun's rays to plants if they will observe how plants reach out for sunlight bending their form in the direction from which the plant receives its most light. If a plant be placed within a cellar with only one source of light as a window, that plant will grow toward that light, as if it were bending every force within it to breathe in more sunlight. Who has not observed how fruit fails to ripen so readily in the shade? Those bunches being shaded most, being the last to ripen, if at all like those bunches having free access to both sunlight and fresh air. The writer but recently observed in a field of corn where a portion of the corn received shade during a part of the day how that portion being shaded a part of the time failed to grow and mature as the remaining portion not shaded. The puny stalks and dwarfed ears remained green and undeveloped while the remaining portion of the field had developed large strong stalks and ears of corn. He also observed, where corn had been planted on each side of a shaded street, that corn growing on the east side of the street leaned strongly to the eastward in the direction of the forenoon sunlight and away from the shade on its westward side, while the corn on the opposite side of the street leaned just as strongly to the westward toward the side where it received the sun during the afternoon and away from the shade on its eastward side. He also noticed that tomatoes growing where they did not receive sunlight failed to bear at all, while other tomatoes planted where corn was growing remained green and failed to bear until the roasting ear corn had been gathered and the stalks cut, when the tomatoes began to blossom and bear in response to the stimulus and vitalization given to the vines by removing the shade and giving them access to fresh air and sunshine.

The writer has observed that grapes receiving the shade of the vines and those growing low down near the ground will remain unmatured and green while on the same vines other bunches having access to an abundance of sunshine and fresh air will ripen much earlier and develop into a much better fruit, both in flavor and size. The same is true of apples and of peaches and of cherries. In fact, all observation teaches us that vegetation grows and bears and matures earlier and better where it receives plenty of sunshine and fresh air.

What is thus true of the vegetable kingdom is also true of the animal kingdom. Children require to have plenty of fresh air and an abundance of sunshine if they are to grow and develop into the most perfect specimens of their kind. The child that does not take sufficient fresh air into its lungs and receive the bracing influence of fresh air within its own blood and tissues will grow into the green, sallow complexioned child so common in our cities or often in country homes in the tender creature too languid to take sufficient exercise in the open air and too closely confined to be allowed the supposed exposure to a free access of an abundance of pure, bracing air and life giving sunshine. It must be noted that with animals as well as with plants that an abundance of sunshine and pure air are necessary to development and maturity of cell growth. Yet simply sunshine and outdoor air must not be considered in too broad a sense, for it is not simply the simple sunshine and outdoor air that are the essential qualities, but rather the degree of residual solar vital energy in the air breathed by both plants and animals that becomes so essential to their vitality, development and growth.

It has been observed that the child nearer the equator arrives at the years of puberty sooner than the child farther from the tropics. It is also observed that the pigment of the skin is of a darker hue in the inhabitants nearer the equator than in those more remote; yet these inhabitants are more languid and less energetic than the inhabitants at greater distances from the equator. It is also true that vegetation does not grow so rapidly and mature so quickly near the tropics as farther toward the poles. It may be claimed for the child that the excessive heat renders it impossible for it to lead an active life, and as idleness begets a greater proneness, by the mind being unemployed, to gratify the sexual instinct, the tropical child allows its mind to dwell at greater length upon sexual thoughts or desires, and thus through the influence of the mind over the glandular secretions and growths of its sexual organs, it naturally matures earlier than the child more remote from the equator. It may be claimed for plant life that certain varieties mature earlier than others, and that only such varieties as do mature sufficiently early to ripen their seed can be successfully propagated. Such influences doubtless have their effects and must be considered with fairness, yet to the writer's mind such explanations, while having their bearing, do not wholly solve the real problem; there are other weightier influences that must not be overlooked.

CHAPTER II.

MOVEMENTS OF HEAVENLY BODIES CONSIDERED.

In the principles herein given the writer throughout this work does not hesitate to give such views as may appear most reasonable to his own mind, whether such views are at variance with so-called science or not. He reserves the privilege at all times to do his own thinking and readily rejects those principles at variance to his own reasoning powers and does not hesitate to give those principles that appear most reasonable to his own mind, whether such principles may be entertained by socalled scientists or not, leaving the reader to judge as to the feasibility of the principles entertained by the writer and giving the reader the same privilege that the writer reserves for himself, the privilege to accept or reject according to the principles of true reason as applied to the subjects under discussion.

So in viewing the principles and forces existing in the movements of heavenly bodies, the writer will give the conceptions formed in his own mind through such light as has been given him and respectfully asks the reader to give his views thoughtful and intelligent consideration and then to do as the writer has done, give preference to those principles in nearest conformity to reason verified by the evidence of natural phenomena as produced in nature in the world about us and in the universe at large.

A GENERAL VIEW OF THE SOLAR SYSTEM, OF THE EARTH IN THE SOLAR SYSTEM AND OF THE REVOLUTION OF THE EARTH AROUND THE SUN.

The planets of the solar system not only revolve around the sun but with the sun as their center revolve around a more magnificent unit of attraction, which the writer shall designate the center of the universe. (See Plate 1.)

This center of the universe the writer shall designate as the celestial center. The celestial center may be what appears to be the North Star, or what is known as the star polaris, to which the north pole of the earth appears to point. Yet this star is slightly distant from the true direction to which the north pole does point a distance of 1°15′.

It may be that the north star is only a center of a system revolving between our solar system and the true celestial center. The true celestial center may be so far distant that its light is partially or wholly obscured by the radiance of the north polar star, and hence cannot be seen by our most powerful telescopes. (The reader will bear in mind that in order for the human eye to perceive an object, the object must subtend an angle of at least 1′, or 1-21600 of an entire circle upon the retina of the

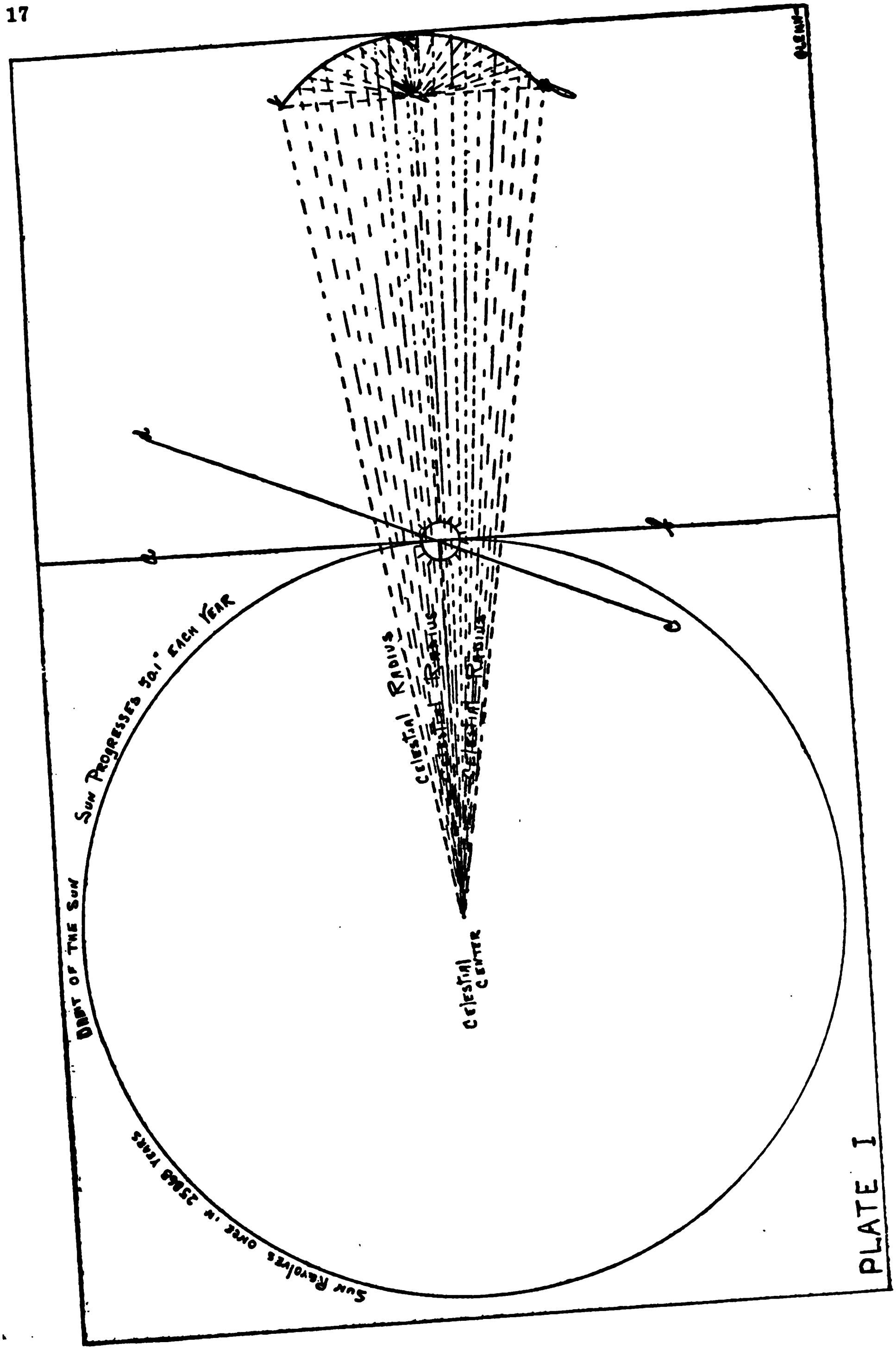

Orbit of the Sun
Sun Progresses 50.1" each Year
Sun Revolves once in 25868 years
Celestial Radius
Celestial Radius
Celestial Radius
Celestial Center

PLATE I

human eye. If the object is too far distant for the telescope to focus an object with sufficient magnitude to be perceived by the human eye, the object however large will not be perceived.) Hence the celestial center may be so far distant that it fails to subtend the required angle to be perceived by the human eye, or its light may be so obscured by the brilliancy of the north star as not to be distinguished from the light of the north star.

The Celestial center may be God's abode from which may emanate the forces that keep the spheres of the various systems in unison to the order in which God has placed them. From this center may emanate the force productive of all thought, intelligence, force of whatever nature, necessary to a harmonious action of any unit, however large or small, or any system acting as a unit and coordinating with any other unit or system of units in obedience to the laws of God governing such units, from this source all forces may originate and to this source all forces that have lost their coordination with their respective units may be ultimately gathered or attracted where they may strengthen the central force, forming a reserve for the great universal force. It is found that the sun travels or deviates annually about 50.1″ in the celestial sphere. From this it is estimated that it will require about 25868 years for the solar system to make a single revolution around the celestial center. We will assume that the celestial center is the primary center of universal gravitation, hence all bodies that lose their fixity in the heavens must inevitably drift into this center unless they find their coordination somewhere before reaching the celestial center. Let the celestial center be conceived as a fixed point to which all bodies are attracted. From the celestial center let radii be drawn tangent to the orbit of the earth through all its points and extended outward toward the celestial circumference reaching beyond the limits of the farthermost point of the earth's orbit. It can be readily conceived how that a cone will be thus outlined within the celestial sphere having for its lateral boundaries celestial radii passing through the orbit of the earth and its apex the center of the celestial sphere. The earth rotating in its orbit around the sun will have at all times its north pole pointing to the celestial center while the axis of the earth will at all times coincide with a celestial radius outlining this assumed celestial cone. We will assume that this celestial cone revolves upon a fixed point, the celestial center, and makes a revolution in the celestial sphere, carrying with it the earth and sun, making a revolution in the celestial sphere to correspond with the revolution of the solar system around the celestial center, requiring about 25868 years to make a single revolution around the celestial center.

For simplicity let us assume a chord drawn through the center of the sun and intersecting the radii of this assumed celestial cone that pass through the orbit of the earth and coincide with the earth's axis at the times of the earth's equinoxes. We now have the earth revolving upon its axis with its north pole pointing to the celestial center and requiring approximately 24 hours to make a single revolution upon its axis.

The sun, too, revolves upon its axis, which is inclined to a perpendicular to the ecliptic about 7°15′. The sun's revolutions having been determined by sun spots and found to require approximately about 25 1-2 days.

The earth revolves daily upon its axis which has been determined to correspond in direction approximately to a radius of the celestial sphere. That is if the earth's axis at all points in the earth's orbit were extended northward it would terminate at or near the celestial center. (See Plate II.)

The earth's orbit will then encircle the cone thus outlined.

The line passing from the center of the earth to the center of the sun at the times when the earth is at its equinoxial points, will pass directly through the equator of the earth. At such times rays from the sun will fall directly tangent to the poles of the earth. The sun's diameter being about 866,500 miles while that of the earth is about 8000, it is apparent that the sun's diameter being so much in excess of that of the earth, rays of light will fall upon each pole, although the north pole of the earth slightly inclines more to the sun than the south pole. It will be perceived that the transverse section of the celestial cone as outlined will be slightly narrower at the north pole than such a section will be at the south pole, due to the convergence of the celestial radii. If density can be ascribed to the celestial atmosphere, if such exists, it will be perceived how that the sun's rays will incline to be refracted in a direction approaching the south pole, although a straight line passing directly from the sun to the south pole at the time of her equinoxes may miss the south pole, due to the slight divergence of the celestial radii. Yet we are certain of the density of the earth's atmosphere, which would in fact incline the sun's rays, on a line tangent to the southern extremity of the earth, inward toward the earth, which would thus incline to illuminate the south pole at the times of the equinoxes that otherwise might be obscured from the sun's rays due to the divergence of the celestial radii outlining our assumed celestial cone. Hence the sun's rays may be tangent to each pole of the earth at the periods of the earth's equinoxes. It is apparent that the path of the earth in revolving around the sun will traverse the surface of this assumed cone and that a line drawn from the earth to the sun at all points in its orbit will cut this cone into two sections. If the earth remained equal distances at all points in its orbit from the celestial center the cone would be cut at right angles to a line passing from its apex through its center to its base, and the sun's rays would at all

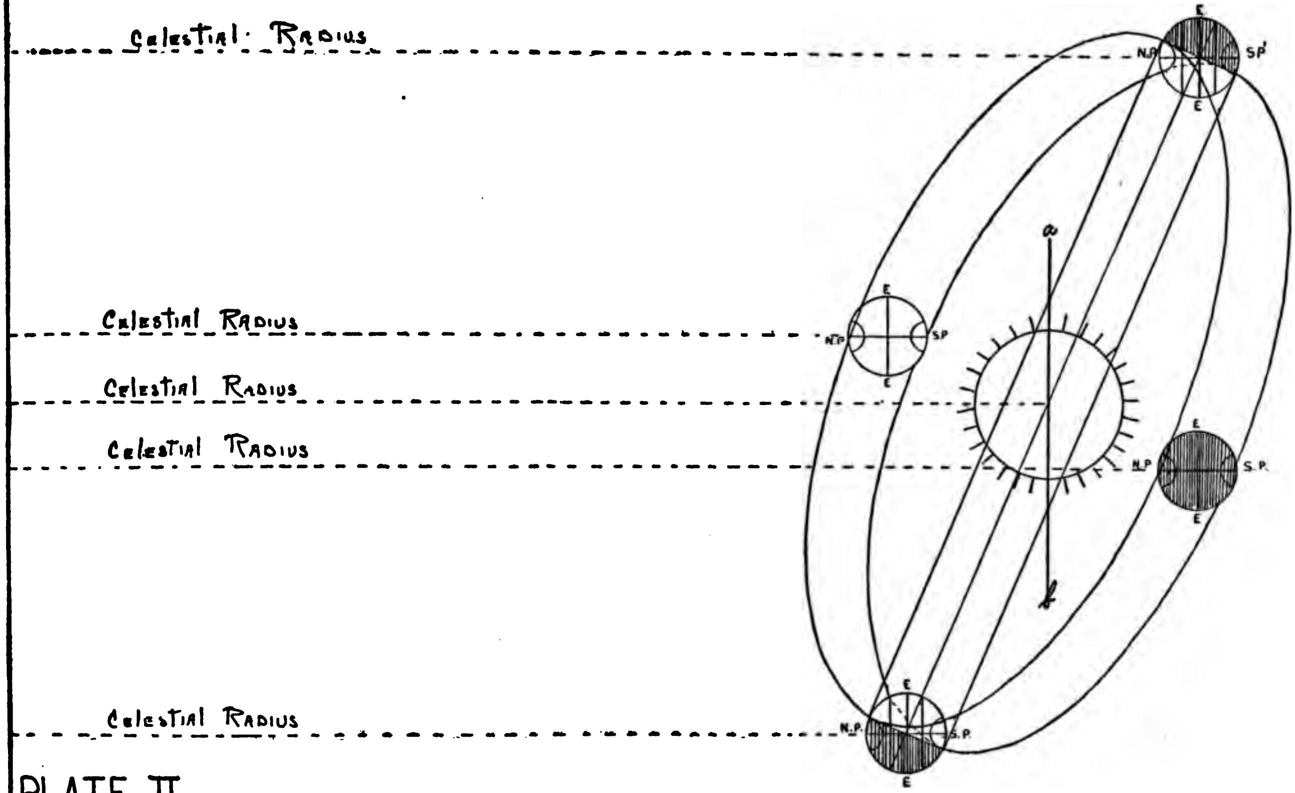


PLATE II

GLENN-

times throughout the entire circuit of the earth fall tangent to the poles of the earth and to a great circle, or line of illumination passing through the poles over the earth's surface. Days and nights would then be equal throughout the year over all points of the earth. This condition is found only at two periods of the year—March 21st and September 22nd, hence the earth's orbit cannot correspond to such a line. It is found that the direct line connecting the earth and sun falls north of the equator and progresses northward after March 21st until the 21st day of June, when it has traveled from the equator 23 degrees, 27′ 40″ north latitude. After June 21st the line connecting the earth and sun begins to recede toward the equator. The line between the center of the sun and the center of the earth on June 21st, passes along the earth's surface at north latitude 23° 27′ 40″, making a circuit of the earth as the earth revolves on its axis on that day. Let us conceive of what has been done or in what direction the earth must have traveled along the surface of our assumed celestial cone, in making this angle from the equator. The earth to produce such an angle at the equator with the north pole and the sun must necessarily travel farther distant from the celestial center, thus forming an elliptical section rather than a rightangular section on the surface of the assumed celestial cone. The angle at this date, June 21st, subtended by a line passing from the earth's center to the sun with the earth's axis passing to the celestial center is 66°32′40″. The earth has traveled approximately through a quadrant or 90° of our assumed celestial cone, making one-fourth of its orbit since March 21st. Let us conceive of the effect of this change upon the earth with reference to the illumination of the sun upon the surface of the earth during this period from March 21st to June 21st.

The sun's rays will travel approximately parallel to the line passing from the center of the earth to the center of the sun. A plane containing the line connecting the earth and the sun and outlining a great circle upon the surface of the earth during diurnal rotation and containing all points of the earth's orbit is called the plane of the ecliptic.

A great circle of the earth perpendicular to the ecliptic, marking the tangents of the sun's rays upon the surface of the earth marking the limit of illumination as well as the limit of day and night upon the surface of the earth is called the circle of illumination. It is evident that the circle of illumination will constantly change upon the surface of the earth as the earth rotates in its orbit throughout the year. On March 21st the circle of illumination will pass through both poles of the earth, while the sun's rays will be tangent to each pole. This point in the earth's orbit is called the vernal equinox in the northern hemisphere and the autumnal equinox in the southern hemisphere. The days and nights in both hemispheres being now equal. After March 21st the circle of illumination begins to recede from each pole. It will be remembered that the circle of illumination is at all times perpendicular to the line of the ecliptic. That being the case it is evident that as the line of the ecliptic passes north of the equator after March 21st, that the circle of illumination will pass beyond the north pole leaving the north pole at all times illuminated, while the circle of illumination will fail to reach the south pole leaving the south pole continuously unilluminated by the sun's rays. Thus the north pole after March 21st will be subjected to continual illumination while the south pole will be subjected to continual unillumination. The circle marking continuous day around the north pole and a like circle marking continuous night around the south pole will begin at the poles on March 21st and growing larger each moment recede from each pole respectively toward the equator, until on June 21st when each circle will have receded a distance of 23°27′40″ from each pole respectively. The ecliptic has now reached a distance of 23°27′40″ north of the equator, the sun's rays now pass beyond the north pole and fall tangent to the earth 23°27′40″ beyond the north pole, while the sun's rays will fail to reach the south pole becoming tangent to the earth's surface along south latitude 66°32′20″. The line of tangent to the sun's rays at this time June 21st is 66°32′20″ from the equator in both hemispheres. The tangent line to the sun's rays on June 21st in the southern hemisphere is called the antarctic circle, while the tangent line at this time, June 21st, in the northern hemisphere is called the arctic circle. As the circle of illumination is always at right angles through the center of the earth to the plane of the ecliptic, it is evident when the plane of the ecliptic passes to 23°27′40″ north of the equator on June 21st, that the circle of illumination will mark a distance of 90° both north and south from that point. Thus the line of illumination will fail to reach the south pole and fall along the antarctic circle, while it will pass beyond the north pole falling upon the opposite side of the earth upon the arctic circle. Thus around the north pole will be subject to continuous illumination on June 21st as far as the arctic circle, while around the south pole as far as the antarctic circle will be subject to continuous unillumination.

It is evident that the days will grow continuously longer and the nights correspondingly shorter in the northern hemisphere after December 22nd to June 21st, while in the southern hemisphere the nights will likewise lengthen and the days likewise shorten.

After June 21st the days will grow continuously shorter and the nights continuously longer in the northern hemisphere until December

22nd, while in the southern hemisphere the days will grow continuously longer and the nights correspondingly shorter from June 21st to December 22nd. Thus in the northern hemisphere we have our longest day and our shortest night on June 21st and have our longest night and our shortest day on December 22nd; while in the southern hemisphere they have their longest day and their shortest night on December 22nd and have their longest night and their shortest day on June 21st.

It is found that after June 21st the ecliptic fails to travel farther from the equator, but turns at north latitude 23°27′40″ and starts southward toward the equator. This point is called the tropic of cancer, likewise 23°27′40″ from the equator in the southern hemisphere is called the tropic of capricorn. It is evident that the line of illumination will likewise cease to pass farther from the poles but will now begin to approach the poles. The period, June 21st, marking these changes is called in the northern hemisphere the summer solstice, while in the southern hemisphere it is called the winter solstice; likewise the corresponding period in the southern hemisphere, which occurs December 22nd, is our winter solstice of the northern hemisphere and their summer solstice of the southern hemisphere.

The ecliptic will recede from the tropic of cancer after June 21st and approach the equator while the line of illumination will likewise recede from the antarctic and arctic circles and approach each pole respectively until the ecliptic reaches the equator and the line of illumination reaches each pole respectively on September 22nd. This occurrence, September 22nd, marks another period in which the days and nights are again equal and the northern and southern hemispheres are again equally lighted by the sun's rays. This period is called the autumnal equinox in the northern hemisphere. The earth has now passed since March 21st through half its orbit. It is evident that in order for the earth to again reach this position relative to the sun, that the path of the earth must have traveled on this assumed celestial cone to a line or radius equally distant from the celestial center with that position maintained by the earth at the vernal equinox on March 21st.

After September 22 the earth travels in its orbit around this assumed cone in such a line as to incline the ecliptic from the equator toward the south pole. The great circle of illumination marking the limits of the sun's rays now again recedes from the poles, leaving the north pole continuously in darkness and the south pole continuously exposed to the sun's rays. This circle continues to recede from the poles, marking periods of longer days in the southern hemisphere and shorter days in the northern hemisphere with nights correspondingly shortened in the southern hemisphere and lengthened in the northern hemisphere until the line of illumination has reached a limit of 23°27′40″ from each pole, while the ecliptic has reached a limit of 23°27′40″ from the equator. The earth has now passed through three-fourths of its orbit and marked 270° upon its orbit since March 21st, the vernal equinox. This period is reached on December 22nd and is called the winter solstice of the northern hemisphere. The angle of the ecliptic with the equator is now 23°27′40″ southward, and with the north polar axis 113°27′40″. It is evident that the earth must have traveled during this quadrant approaching the celestial center and have passed on the surface of our assumed celestial cone toward its apex. After December 22nd the earth again travels in its orbit through its first quadrant, the plane of the ecliptic again receding toward the equator and the great circle of illumination marking the limit of the sun's rays, again travels backward toward the poles, the ecliptic reaching the equator again on March 21st, and the line of illumination reaching the poles at the same time, the earth having traversed throughout its entire orbit and having reached the same relative position to the sun as it occupied on the previous March 21st. The sun having passed through 50.1″ of the celestial circle and having carried the earth and the planets of the solar system with it, the earth is within 50.1″ of its original position that it occupied the year previous in the celestial sphere. We now have a line marked on the assumed celestial cone of the celestial sphere by the earth in its path around the sun, which determines the direction of the earth's orbit and the true shape of the orbit. We find that the earth has marked out an ellipse upon this cone, dividing the cone into two sections by the line intervening between the earth's and the sun's centers during the annual revolution of the earth. From this conception we can easily conceive of the relative positions of the sun and earth during the entire year or during any particular period of the year.

THE PRESENT THEORY OF THE EARTH'S MOVEMENTS DISCUSSED.

It is taught and possibly by many believed that the movements of planets result from some initial force, exerted upon such planets, at some remote age and in some unknown way and by some unknown projectile force or hand, in such a manner that the attraction for such bodies by the central power as the sun has produced a resultant giving the planets respectively their present movements around their respective central bodies, as our sun.

Taking the earth for example, let us seek to carefully consider the action of such forces as are claimed to produce the present movements of the earth and carefully weigh the manner of the application of such forces and then conclude whether present conclusions are justifiable or overdrawn and reason mystified and stretched into the realm of the impossible in order to substantiate the claims of the present theory of the earth's movements.

It is claimed that some initial force so acted upon the earth as to hurl the earth as a projectile into space and that the earth must have moved according to Newton's First Law of Motion in a straight line until it came within some ninety millions of miles from the sun when it came under the influence of the sun, at least the possible action of the sun prior to the earth's coming into that relation is not discussed, but as the sun is supposed to act upon even distant Neptune, some thirty times distant from the sun as the earth is at present and both rotating around the sun and both subject to the influence of the sun, we cannot conceive how the earth escaped from the sun's influence long before it ever came so near the sun. But let that be as it may, yet it does appear strange that if the sun has such an attractive influence over the earth, that such influence was not exerted upon the earth long before it came within ninety millions of miles from the sun; yet we will give the present theory the benefit of the doubt and ignore the influence of the sun upon the earth until the earth reached a distance of ninety odd millions miles from the sun when in its initial course apast the sun it suddenly came under the influence of the sun at a tangent acting at right angles to the course of the earth while entirely under the influence of its original projectile force.

It is not claimed that the initial force was exerted in a direct line with its center of gravity, that is, the force directed along a straight line passing from the point of impact to the earth's center, but that the initial force was exerted along a line passing from the point of impact upon the earth's surface through space slightly missing the earth's center by some 24 3-4 miles and that by this force being so directed the earth was given a rotary motion upon its axis, hence the present diurnal movement of the earth upon its axis. Olmsted in his astronomy designed as a text book for the students of Yale College says, "Bernoulli, a celebrated mathematician, has calculated that the impulse must have been given nearly in the direction of the center, the point of projection being only the 165th part of the earth's radius from the center." Olmsted further says, "This impulse alone would cause the earth to move in a right line; gravitation towards the sun causes it to describe an orbit." Yet while the earth under such an impulse would be impelled in a straight line it would also spin round and round as a top, giving to the earth a motion similar to its present diurnal rotation."

Thus the diurnal rotation of the earth is supposed to have been produced, which as to the diurnal rotation of the earth is not a very unreasonable theory.

The annual rotation of the earth around the sun is supposed to have been produced by the attraction of the sun for the earth as it came hurling apast the sun from its initial starting point. It is claimed that the earth under the influence of its initial impulse came hurling through space in a straight course falling tangent to the sun some ninety odd millions miles from the sun; that when the earth came into such relation with the sun the attraction of the sun for the earth became of sufficient force to cause the earth to deviate from its original straight course toward the sun; that this point of first influence must have found the earth at or near its aphelion; that as the earth deviated from its original straight course and began to incline toward the sun in its course it began to approach nearer the sun and in so doing the attraction of the sun for the earth began to increase, which caused the earth to increase its velocity and hurl apast the sun; that just as soon as the earth began to pass the sun the increased attractive force of the sun for the earth caused the earth to be drawn back inclining to the sun bringing the earth to its point of perihelion, when the increased velocity had become so great as to cause the earth to gradually pass farther from the sun, thus the increased velocity serving to slightly overcome the increased attractive force of the sun for the earth, which caused the earth to pass farther from the sun and in so doing lessened the attractive force of the sun for the earth; but as the direction of the sun's pull for the earth then no longer drew at an acute angle with the line of the earth's centrifugal force but then became exerted at an obtuse angle, which served to retard the velocity of the earth until that point had been reached where the velocity had been sufficiently checked to again allow the earth to be so drawn upon by the sun that the attractive force of the sun for the earth was again sufficient to cause the earth to again deviate from its course so that it would again approach the sun at an acute angle with the line of the earth's centrifugal force such point of change being called the earth's perihelion and to so exactly correspond in relation to the initial influence of the sun over the earth as to not cause any perceptible change in the relation of the earth to the sun in its future course around the sun in traversing its entire orbit, through all the successive revolutions that have transpired since the initial contact of the sun's influence with that of the earth in its random course through space, while under the full influence of the initial impulse that caused it to start from its original starting point from somewhere in space.

Let us note carefully the force of the above reasoning. It is not claimed, nor can it be reasonably claimed, that the earth or any mass hurling through space while uninfluenced by another body gains in its velocity or momentum from that imparted to it by its initial propelling force. Thus the earth must have started from its initial starting point at a certain velocity and maintained that same velocity throughout its entire course until it came under the influence of some other body, as the sun. The moment the earth came under the influence of the sun that moment it became acted upon by two forces; the first, its initial propelling force that would cause it to endeavor to continue onward in the same straight course as originally imparted to it, such force is designated the centrifugal force of the earth; the second force, that of the sun exerted upon the earth to cause the earth to deviate from its original course and incline to the sun, such force is called the centripetal force of the earth.

The earth being acted upon by both the centrifugal and the centripetal forces becomes in the same relation and acted upon by identically similar forces as any projectile upon the earth. A ball shot from a gun will serve for a good illustration, as the forces acting upon the ball are exactly similar to those claimed to have acted and are now acting upon the earth to cause it to pursue its course throughout its orbit around the sun. When a ball is shot from a gun, the moment it leaves the gun it starts in a straight course in that direction imparted to it by the impelling force and if not acted upon by another force would, according to Newton's First Law of Motion, continue to travel forever in the identical direction given to it by its initial propelling force, thus the earth is said to have traveled while subject to its initial propelling force only. But with the ball shot from a gun, the moment the ball leaves the gun the attractive force of the earth begins to draw the ball toward the earth, so with the earth when it came under the influence of the sun, the sun began to draw upon the earth and cause it to deviate toward the sun.

We will let the unknown quantity representing the initial striking force imparted to the earth be represented by the letter X. Thus the propelling force of the earth at the moment that it came under the influence of the sun was equal to the unknown quantity X.

We will suppose that the attractive force of the sun for the earth while the earth was at its aphelion at the moment that the earth is recognized as coming under the influence of the sun for the first time, was equal to the unknown quantity Y.

It is evident that the earth's orbit lies in the line of the resultant that is being constantly formed from the action of the forces exerted upon the earth's mass. That being true then the direction taken by the earth will represent the mean between the centrifugal and the centripetal forces, hence the centrifugal force must be exerted along a plane lying outside of the earth's orbit, while the centripetal force must be exerted along a plane lying within the earth's orbit. At no time will the centripetal and the centrifugal forces act within the same plane, but at all times the centripetal force must serve to check the outward tendency of the centrifugal force and in so doing impede its progress on the same principle that a race horse would have its progress checked to have a line constantly drawing it from the straight line in which it may be endeavoring to run at full speed during some test of its racing powers. A force acting in such a manner would serve to retard rather than accelerate the progress of the animal, so would the socalled centripetal force serve to check the socalled centrifugal force of the earth in its progress around the sun. At no time does the centrifugal and the centripetal forces act along planes running in the same direction, but rather at all times act at or near right-angles to each other, hence the centripetal force must serve to retard at all times and never accelerate the velocity of the earth in its orbit which is being maintained by the centrifugal force of the earth.

Thus the centrifugal force represented by the unknown quantity X must be constantly reduced by the centripetal force represented by the unknown quantity Y. As the centrifugal force is being constantly retarded and reduced by the centrifugal force and as the centrifugal force has only its original impelling force in store with no means of increasing its original force save by some impulse acting along or near the same line of the centrifugal force, it is evident that the centrifugal force unless reinforced in some way must at some time become exhausted by the constantly depleting effect of the centripetal force acting upon the earth's mass.

We must not confuse our reasoning powers by such an error as to regard the earth acted upon in both its centrifugal and centripetal forces by the sun, similar to climbing a mountain or a high tree and shooting a ball downward as near perpendicular as practical. It is evident that a ball so shot from a gun will have its projectile force reinforced by the attractive force of the earth and as any falling body increases its velocity the nearer it approaches the earth, so will the attractive force of the earth serve to increase the velocity of the ball and in so doing the ball will have its initial velocity increased by what may be termed the centripetal force of the ball. In such a case both forces act within or nearly within the same plane.

It is evident that if the earth did not lie within the plane of the resultant between the projectile force of the ball shot from a gun and the gravitation of the earth for the ball that the gravitation of the earth would serve to retard and not increase the velocity of the ball; just so with the centrifugal or projectile force of the earth and the centripetal force or gravitation of the sun for the earth, if the sun lies without the plane of the resultant between the projectile force of the earth and the sun's gravitation for the earth, the gravitating force of the sun must retard rather than increase the projectile force of the earth. But it is not claimed that the sun does or ever has been in such a position relative to the earth's forces, as the earth's orbit which represents the resultant between the centripetal and the centrifugal forces of the earth lies wholly without the sun in all its points, yet such a condition is implied from the claims of such a theory. Therefore it becomes evident that in order to increase the centrifugal force of the earth some force must be exerted along a plane lying without the present orbit of the earth, which represents the resultant of the forces acting upon the earth.

The radius vector, that is the distance between the earth and the sun, has been found by taking the diameter of the sun at different periods of the year, to differ only about 3,000,000 miles from the earth's farthest distance from the sun, at the period of the summer solstice, June 21st, and when taken at the times of the earth's nearest distance to the sun at its winter solstice, December 22nd. Thus the sun is only about 1.034 times as far from the earth at the time of the earth's aphelion than it is at the time of its perihelion. Thus we see that the centripetal force of the earth cannot vary much from acting at right angles to the centrifugal force of the earth at any period of the earth's orbit, consequently the forces acting upon the earth do not at any period according to the present theory exert their respective forces upon the earth within or near the same plane at any point in the earth's orbit, consequently the sun must retard at all points in the earth's orbit the initial projectile force of the earth and as the initial projectile force of the earth has no other means of replenishing its original projectile force it must at some time become exhausted, when the earth will be left with an augmented centripetal force to draw it into the sun, consequently if such a theory be true the earth would have long ago found rest within or upon the sun's mass.

Thus the force representing the value of X must be constantly reduced by the force representing the value of Y. Let the letter m represent the amount of reduction of X by the force of Y acting uponX, then while the earth should approach and fall into line with the earth's orbit with a projectile force equal to X, the moment that it would come under the influence of Y, the force of X would become reduced to the extent of the value of m. When the projectile force would become equal to the quantity (X-m), the earth would then begin to deviate from its original straight course and slightly approach the sun. It is evident that the moment that the earth would begin to approach the sun that the value of Y would increase and consequently the value of m would likewise increase, while the value of X would correspondingly decrease according to the law of attraction between two bodies, this law being directly proportional to the masses and inversely proportional to the distance between their respective centers. Thus the earth would begin to approach the sun and the sun correspondingly approach the earth. This being true it is evident that the nearer the earth would approach the sun, the greater would be the drawing power of the sun for the earth, estimated according to the above law.

For the sake of simplicity we will suppose that the attractive force of the sun for the earth was not augmented by decreasing the distance to the sun by the earth approaching the sun but will suppose that the sun would not so act upon the earth until the value of X would become exhausted. If each moment of time the force Y reduced the force X by the quantity equal to the value represented by m, then it would require as many moments, we will say seconds of time, as m is contained times in X to exhaust the projectile force X. Then X divided by m will represent the number of seconds required for the centripetal force of the earth to exhaust the centrifugal force of the earth, we will suppose the quotient to be n seconds. Then after the earth came under the influence of the sun in n seconds of time the attractive force of the sun would exhaust the earth's original projectile force when the earth would become as a falling body and fall into the sun as a falling body, providing the sun would continue its power of attraction for the earth until the earth should reach the sun, and in so doing would like the ball fired from a gun; as the ball finds rest finally in or upon the earth, or mass, serving by its power of attraction for the ball to overcome and annul the initial projectile force imparted to the ball, so would the earth find rest finally in or upon the sun, serving by its power of attraction for the earth, to overcome and finally annul the initial projectile force imparted to the earth. Thus, if such a theory be true, the earth would have long ago found its final resting place within or upon the sun.

To the writer the above theory regarding the movements of the earth around the sun appears very defective, so much so that it seems strange that scientific men of this age would readily accept it as true. Yet it appears that the world always accepts the most plausible theories and calls them scientific truths until better theories are produced; hence no theory regarding any science should be regarded other than fallible, unless such theory can stand the closest scrutiny and prove its truth through practical application in every possible demonstration of truth to which such theory may apply.

When we consider that, when the present theory was developed concerning the world's movements, that Franklin had not yet directed the attention of the scientific world to the force of electricity nor had electricity, as such, been investigated in the realm of science, we can then make all reasonable allowance for possible errors in the present theory of the earth's movements and give due honor and credit to men of science of that day who labored with earnestness and great persistency without having the conceptions of electrical phenomena and the nature of its force developed in their minds from which they could make further research as to its nature and new discoveries in the application of its force, not only in the world about them but in the universe at large. Hence we are not to treat their possible errors lightly nor with derision but with that courtesy and respect due earnest laborers in the great research for truth.

CHAPTER III.

THE WRITER'S OWN THEORY OF HOW THE PLANETARY MOVEMENTS ARE PRODUCED AND MAINTAINED

The writer asks the reader to follow him closely in his endeavor to unfold the following theory of his own conceiving, which appears to his mind as the true solution of the application of the forces producing the movement of the heavenly bodies, yet as to the nature of these forces we know but little and still less of why they so act and from whence they come. To all these we must be content to attribute them as yet to the unknowable. Doubtless these forces are but attributes of the omnipotent God of the universe, yet known to His omniscient mind and ever guarded by His omnipresence and possibly become a portion of His omnipotence.

The finite mind must be content if it only discovers the application of the great governing forces producing the movements of the heavenly bodies, maintaining life and giving growth and development to all living forms upon the earth and possibly upon all other heavenly bodies as well. To the finite mind it is no little satisfaction to know that the movements of our own earth are through this great governing force made perpetual and not subject to any haphazard movement resulting from uncertain forces that may at any moment plunge this old earth into a wild race for a point of equilibrium among the spheres of the universe. But of greater consequence is the application of this force to living forms wherein life finds a material abode, remaining and giving all the phenomena of material and mental growth and development, wherever and whenever conditions are rendered suitable for these great life sustaining forces to act within material forms.

The writer asks the reader to follow him with thoughtful, intelligent consideration while he endeavors to unfold what he considers the true theory and the true application of force upon the earth and all other planets as well, resulting in both the diurnal rotation of the earth and other planets and in the movements of such bodies around the sun, and further in promoting and sustaining life upon such heavenly bodies.

The writer asks the same consideration but no more than is given to the present accepted theory regarding the movement of the heavenly bodies and asks that close, intelligent scrutiny be given it and that it be compared with the present theory and that unbiased judgment may be given each theory, that whatever of error may be found in each may be rejected and whatever of truth may be found in each or in either of them may be the more intelligently vindicated.

THE PRINCIPLES OF THE WRITER'S THEORY DISCUSSED AND APPLIED.

In the study of natural philosophy we were taught and led to observe through experimentation that when two bodies sufficiently light for the contained force, which we designated to be electricity, to influence each other, were charged with electricity and brought into sufficiently close proximity, that the bodies were at first attracted and after clinging to each other for a short time they rejected each other and each expelled the other.

Most every person who has made any study at all with electricity is familiar with the experiment shown with pith balls, how they at first attract each other, then after a short interval of time repel each other. From much experimentation with electricity, scientists have put forth two theories. One theory, that two kinds of electricity exist, one kind they designate as positive electricity and the other kind as negative electricity. From this theory they have deduced the law that "Like poles repel and unlike poles attract." The negative electricity attracting the positive and the positive being drawn to the negative, while the positive pole will be repelled by the positive pole of another electrified body and attracted by the negative pole of another electrified body and vice versa.

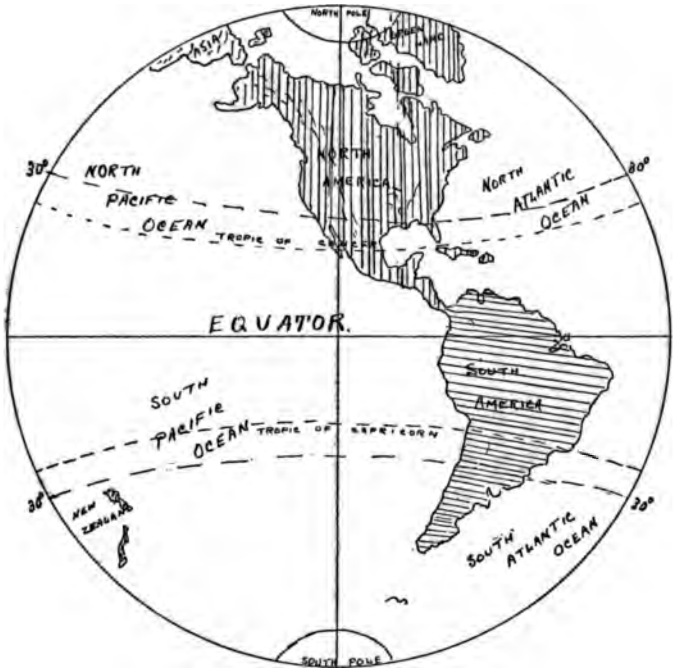
The other theory is that but one kind of electricity exists, but that bodies differ in the degree of electricity contained. That whenever two electrified bodies are brought into sufficiently close proximity, that the one containing the heavier charge of electricity between its molecules will attract another body having a less degree of electricity between its molecules, the movement of each body depending upon the relative weight of each. The body containing the greater degree of electricity being relatively positive to the other body, yet it may be negative to another body containing a greater degree of electricity between its molecules than that which it may contain. Thus under this theory electricity is considered to be of but one kind yet differing only in degree, that when differing in degree the one containing the greater degree of electrical force will be positive to all other bodies containing a less degree of electrical force and negative to all other bodies containing a greater degree of electrical force than such body may contain. Positive and negative forces are thus considered but relative between the bodies compared.

According to this theory any body containing a greater degree than another body of electricity will impart of its force unto the other until the other shall contain relatively an equal amount and its molecules be subjected to the same electrical pressure as the other, then the attractive force will cease and the bodies will let go of each other. But why repel, if this theory be true? To this the writer has seen no explanation, but the following has appeared to his mind as possible, if there be but one kind of electricity. The bodies after being alike charged cease to attract each other, and both being charged they naturally impart their electricity to any conducting material of less degree within close proximity. The adjoining air, or any adjoining substance, being less charged, they each impart to the air, or substance, which becomes likewise charged, the electricity, filling between the molecules of air, or substance, causing expansion, which naturally presses against the electrified bodies, causing them to rebound from the pressure in a direction of less pressure, which is to the opposite direction, where the air, or substance, is not alike subjected to both pressures, consequently the rebound or apparent repulsion of like electrified bodies.

Whether there be one kind or many kinds of electricity, the writer does not know, yet as we have different wave lengths in the light, transmitted from the sun, giving rise to the different primary colors of light, as in the spectrum, so we may have as many or many times more different kinds of force acting in different degrees of force or electricity as we may be pleased to call it in the absence of definite knowledge as to what electricity is, or what is the real force existing therein, giving rise to the various phenomena that may be shown and produced by what we term electrical force. It is the phenomenon of alternately attracting and repelling, and the constant readiness to change poles that we wish to call the close attention of our readers, and ask them to keep this law closely in their minds—that like poles repel and unlike poles attract and that poles readily change, or unlike electricities attract and like electricities repel. We assume that the great first cause, whom we designate to be God, knowing the exact degrees of force contained within each system and its every planetary body, as the sun and its planets, evolved them from His central force and placed them within such distances and with such positions as may be required to produce the various seasons, as he then designated to exist, and set the sun and planets in their first motion, and by the laws that regulated the contained force in each body, He set them in motion, which motion by virtue of the contained force with the laws regulating this force, becomes perpetual as long as God may permit such conditions to exist. Let us consider how this may be done and how this condition may continue after motion and position is once given to the heavenly bodies. We assume that God placed the sun in its set distance and relation to the celestial center and gave to it its motion, also the various planets belonging to the solar system. God placed the earth with its north pole pointing to the celestial center, or at least, it, by virtue of the force of gravitation, (See plate III.) would assume that position most naturally, as the hemisphere containing the greatest amount of land or solid matter will naturally have the greatest density and point to the source of attraction, which is the celestial center, on the principle that the heaviest portion or ballast of a boat sinks closest to the bottom of the sea so will the heaviest portion of the earth gravitate toward the celestial center. While it may be ,conceded that the sun is the greater source of attraction, we claim that while the sun attracts the earth it also exerts a repelling force, equally as great, which virtually neutralizes the pulling force, leaving the guiding control of the earth within its orbit to be exerted by the celestial force, as we shall endeavor to explain.

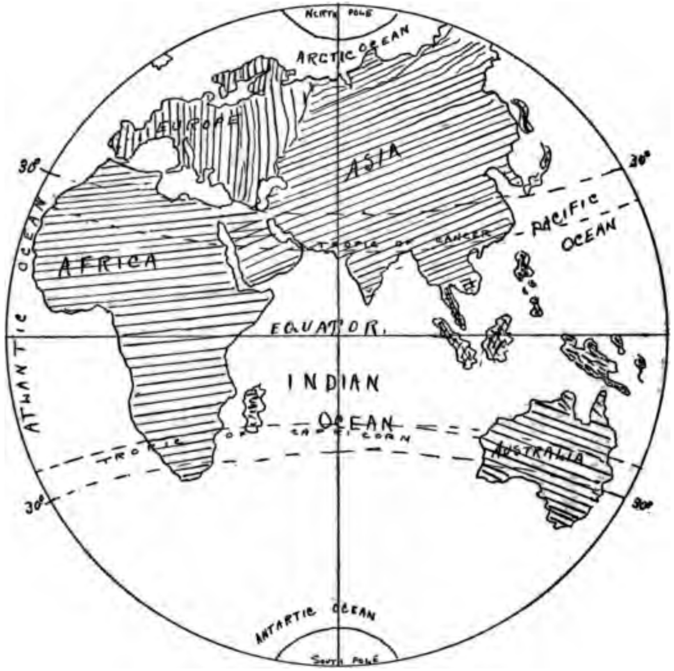
We assume that God used infinite knowledge, with equally as great intelligence and power in forming the planetary systems; that when He gave place to the solar system in space, He knew the nature and exact force of the laws that would govern each planet in its ceaseless march in space. That knowing the mass and the relative density of the surface of each planet as well as that of the sun, consequently He placed each at the most appropriate distance from the sun and set each in motion in obedience to the laws that He determined should produce such motion; thus making the movements of the planets perpetual and the phenomena of living forms possible. It shall be our endeavor to more intelligently comprehend this force and to discover the application of its influence over the heavenly bodies and upon the forms of life as they exist upon the earth.

We can conceive how God in a natural manner, after the mystery of creation had been performed, gave motion to the planets through the influence of Nature's Force, analogous with or may be Electricity. We ask the the careful attention of the reader while we endeavor to unfold our conception of the workings of the heavenly bodies under the influence of this most wonderful force of nature.



WESTERN HEMISPHERE

PLATE III.



EASTERN HEMISPHERE

PLATE III.

GLENN-

HOW THE DIURNAL MOVEMENT OF THE EARTH UPON ITS AXIS IS PRODUCED.

If God, while He first caused the insulating vapors surrounding the earth to be raised or condensed, should have caused a continent to lie in a position east of the zenith line, while he caused an area covered with a vast sea to lie to the westward of the zenith line; we can conceive how, when the insulating vapors had risen or cleared away, what we assume the positive electricity of the sun united for a time with what we assume the negative electricity of the earth along the zenith line and more actively over the readily changeable land area to the eastward from the zenith line, and how this electrical affinity would soon become satisfied and how the electrical poles would soon change upon the surface of the earth. If we recognize the quantitative theory of electricity, we can conceive how the electricity would rapidly accumulate upon the earth's surface at the points of contact of electrical currents and thus cause the earth to be repelled, while the electrical effect upon the opposite side of the earth would diminish by radiation; if we recognize the theory of electricity being different in kind, we can conceive how the electrical poles would change with the negative pole being driven through the earth along straight lines to the opposite side of the earth, as the electrical pressure along adjacent parallel lines alike coming through the earth would tend to prevent any deviation from straight lines, consequently directly opposite the zenith line along the longitudinal line 180° distant from the zenith line would tend to form a negative pole with an electrical affinity for the electricity of the sun, while along the zenith line the electrical pole of the earth would be changing to positive with a tendency to repel the electricity of the sun. Thus over the area of land to the east of the zenith line where the vapors had first been lifted or dispersed and the electrical change would the sooner take place, the repellant force would develop and become active and serve to push the earth from the sun, while to the westward of the zenith line, where the earth's surface was covered with water, the electrical change would be less rapid, the negative force would remain active tending to pull the earth upward toward the sun, thus to the eastward the earth's surface would become electrically positive and would be repelled and descend from the sun while to the westward the earth would ascend toward the sun, thus causing the earth to rotate upon its axis causing the earth's surface to be brought under the sunlight of day and rotated to the opposite extremity under the shadow of the earth into the darkness of the night. Thus the diurnal movement of the earth was possibly first produced and after being produced became perpetual, producing day and night alternately upon the surface of the earth as the earth rotates upon its axis under the

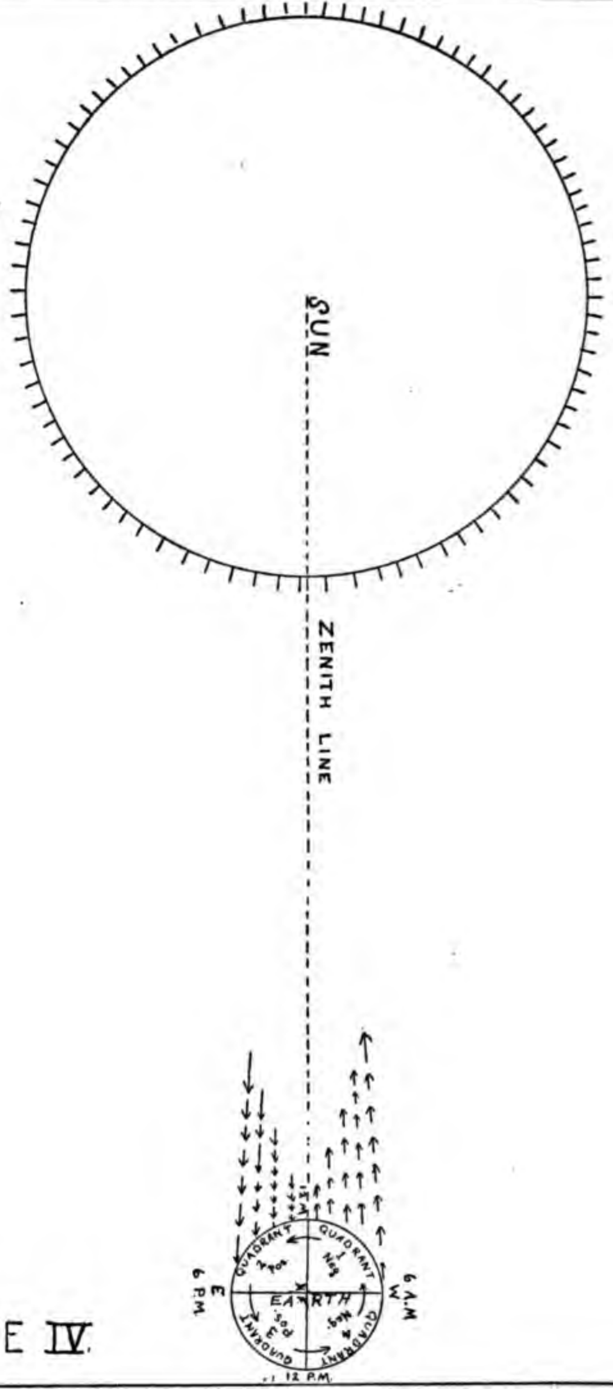

SUN
ZENITH LINE
12 M.
QUADRANT 1 Neg.
QUADRANT 2 Pos.
QUADRANT 3 Pos.
QUADRANT 4 Neg.
EARTH
E
6 P.M.
W
6 A.M.
12 P.M.
GLENN-

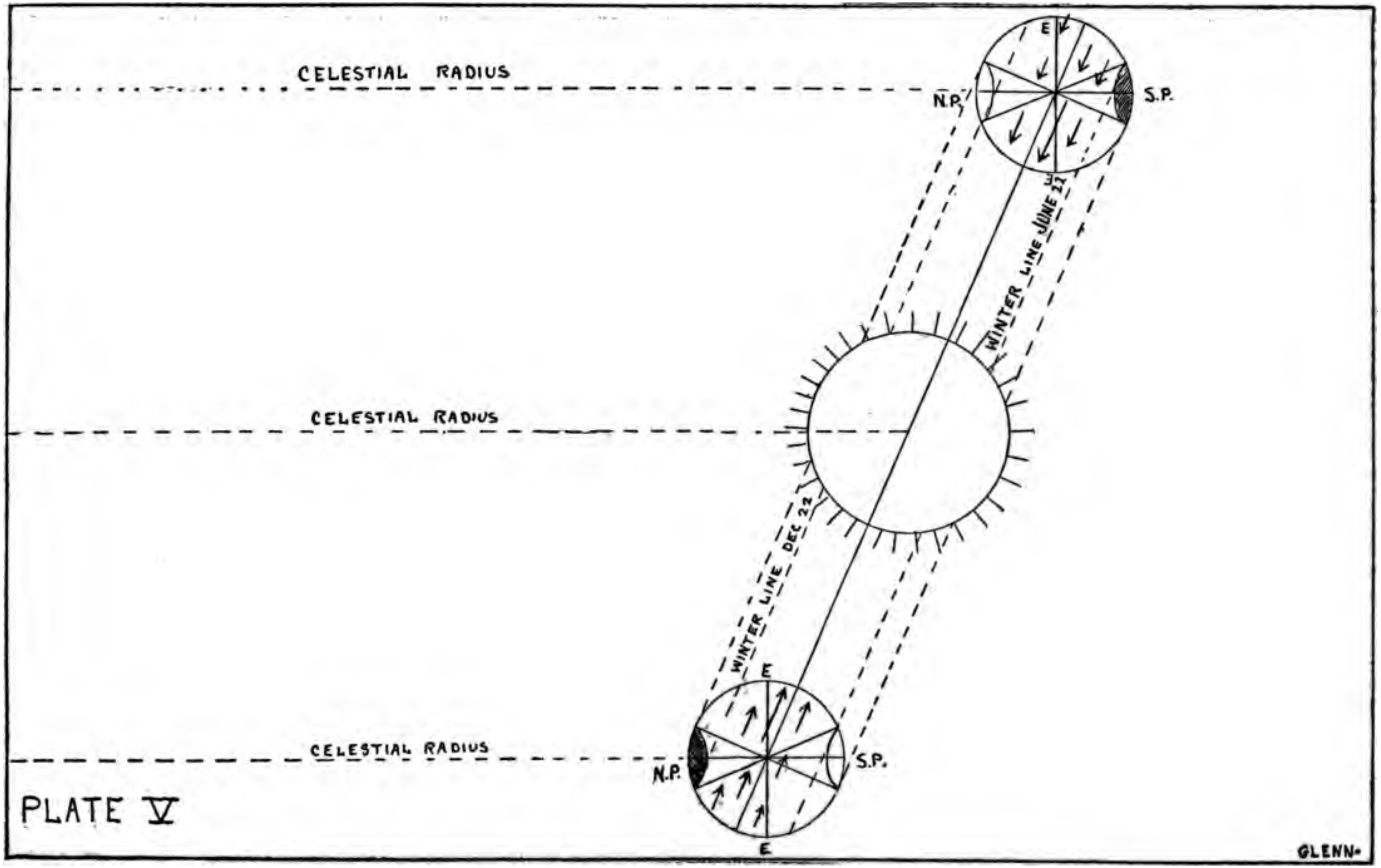
PLATE IV.

influence of the electrical states thus produced between the earth and the sun. (See Plate IV.)

THE ELECTRICAL STATE PRODUCED BY THE SUN'S RAYS UPON DIFFERENT PORTIONS OF THE EARTH.

Let us conceive of the earth being placed in the position of the winter solstice, having its north pole pointing to the celestial center with the ecliptic striking the earth 23°27′40″ south of the equator, with the line of illumination passing 23°27′40″ opposite and beyond the south pole while the line of illumination fails of reaching the north pole by 23°27′40″. We can conceive how the north pole would be thus enveloped in constant darkness, while the south pole would be illuminated with constant sunlight, for a distance of 23°27′40″ from the poles respectively. If the areas thus affected extend for a distance of 23°27′40″ from the poles respectively, in all directions, the total width of each area is twice 23°27′40″ or a total of 46°55′20″ of the earth's surface distributed equally around each pole. Thus all of the earth's surface, at this season, south of 66°32′20″ south latitude is subject to constant illumination by the sun's rays while no part of the earth north of 66°32′20″ north latitude is subject to any portion of the sun's direct rays, but instead is enveloped in the constant shadow of the earth. Thus a ray of sunlight parallel with the ecliptic that strikes the earth along the zenith line tangent to 66°21′20″ south latitude will be 46°55′20″ distant on emerging through the earth, from a parallel ray that strikes the earth on the opposite extremity of the antarctic circle 180° distant and tangent to the antarctic circle. If the first ray were extended through the earth it would emerge to the north 46°55′20″ of its point of entrance upon the opposite side of the earth parallel with the tangent ray and remain the same distance from the tangent ray, which would be 66°32′20″ less 46°55′20″ or 19°37′ south latitude, consequently all rays parallel with the ecliptic striking the area of constant illumination around the south pole would emerge if prolonged through the earth, at points between 19°37′ south latitude and antarctic circle 66°32′20″ south latitude. Likewise, all rays of light falling upon the earth between 19°37′ north latitude and 66°32′40″ north latitude would emerge, if prolonged through the earth, within the arctic circle and thus emerge within the area of constant darkness. (See Plate V.)

The area of constant illumination around the south pole will change under the constant exposure to the sun's rays to positive electricity, or rather become a positive pole, driving the negative electrical state through the earth along lines parallel with the sun's rays and change the surface of the earth between latitudes 66°32′20° and 19°37′ south latitude to a negative state. But the diurnal motion of the earth will each


CELESTIAL RADIUS
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GLENN

PLATE V

day bring all portions of such area between 66°32′20″ and 19°37′ south latitude under the sun's direct rays. The influence of the sun's rays, as already stated, during the diurnal motion of the earth will change such surface electrically, tending to extend the negative pole through the earth along lines parallel with the ecliptic, which at this season will cause them to emerge 46°55′20″ north of their points of entrance. But the unilluminated area around the north pole will not be exposed to the sun's rays during a diurnal revolution, consequently will not change electrically during the diurnal revolutions of the earth at this period of the year. The negative electrical state being driven northward from the southern hemisphere as already indicated, will be driven to the unilluminated area around the north pole and as this area is not at this time subject to daily change by the diurnal rotation of the earth upon its axis, the negative state of the earth will increase around the north pole within this unilluminated area, consequently not being subject to daily change from negative to positive as is the case with all other portions of the earth now subject to daily changes from day to night, therefore the unilluminated area around the north pole will tend to prevent the daily change of all portions of the earth receiving the sun's rays, that would emerge within this unilluminated area, if prolonged along parallel lines with the ecliptic through the earth; hence the earth's surface between 19°37′ and 66°32′20″ north latitude will be in a measure prevented from daily electrical change and consequently be held electrically opposite in kind from the negative electrical state of the unilluminated area around the north pole, therefore positive in kind, consequently this area of the earth will tend not to reciprocate with the electricity of the positive rays of the sun, consequently a lessening in heat production, hence the winter season of the year. (It being the belief of the writer that there is no heat of itself in the sun, save as heat is produced by contact of the sun's electricity with the electricity from some other body. The sun containing an energy capable of becoming an element of heat. The heat of the sun upon the earth being produced by the sun's electricity coming in contact with the electricity of the earth either within the atmosphere of the earth or upon and within the earth's surface, or by contact both within the atmosphere of the earth and upon and within the earth's surface.) As the earth's surface between latitudes 66°32′20° and 19°37′ south latitude is each day rendered negative, due to the constant positive state of the earth's surface, held so by virtue of the constant exposure to the sun's rays of that portion of the earth's surface between latitudes 66°32′20″ and 90° south latitude, this being the area of constant illumination at this season of the year, therefore the positive electrical state of the sun's rays have a reciprocal relation to the negative electrical state of that portion of the earth's surface between

66°32′20″ and 19°37′ south latitude, consequently we have the heat of summer at this season of the year over this area. (See Plate V.)

The diurnal rotation of the earth at this season will each day bring the surface of the earth between 66°32′20″ and 19°37′ south latitude under the influence of the sun's rays which influence will tend, as already indicated, to drive the negative electrical state through the earth along lines parallel with the ecliptic and emerge 46°55′20″ north of their points of entrance; consequently such influence will be felt 46°55′20″ north of 19°37′ south latitude, which will reach as far north as 27°18′20″ north latitude. But, as we have already stated, the earth is influenced as far southward as 19°37′ north latitude, and inclined to be held positive by the negative state of the unilluminated area around the north pole, therefore from 19°37′ to 27°18′20″ north latitude, the surface being held positive, as indicated, the negative influence will not be driven entirely through the earth, but meeting the positive state of the earth along the diagonal line passing through the earth from 19°37′ and emerging at 66°32′20″ north latitude, this negative influence coming from the southern hemisphere will become checked and possibly antagonize the positive electricity along such lines tending to produce, possibly a degree of heat within the interior of the earth, until influenced and driven to its appropriate position during successive rotations of the earth under the influence of the sun's rays upon the opposite side of the earth, as such points rotate within the proper position to receive such influence, upon the opposite side of the earth. We can conceive how the earth's surface between 66°32′20″ south latitude and 19°37′ north latitude is made negative and reciprocates with the sun's rays, resulting in the heat of summer, as such area is daily brought under the sun's rays, and tending to drive the negative state of the earth northward under the influence of the sun as already indicated; but such negative influence as may be driven between south latitude 27°18′20″ and north latitude 19°37′ will strike a mass of earth with a tendency to be held constantly positive from the negative influence of the unilluminated area, consequently such negative electrical force will not find exit from the earth's surface, but will tend to antagonize the positive electricity before finding exit from the earth's interior, consequently tending to increase the internal heat of the earth at the points of contact and accumulate a negative influence within the interior of the earth of the northern hemisphere. We can conceive of the position and contour of such area when we consider the outline produced during the daily motion of the earth upon its axis, through the earth by a diagonal line passing from 19°37′ to 66°32′20″ north latitude, our conception naturally becomes an image of a shell of electrically positive earthy matter covering a conical shaped mass of the earth negatively electrified, with its apex at a point produced by lines crossing each other that extend from directly opposite points of the earth, 180° distant, from 19°37′ diagonally through the earth to 66°32′20″ north latitude. The base of this cone at this season corresponds to a plane parallel with the equator extending through the earth along north latitude 19°37′. It is evident that the base and apex of this cone will vary according to the season of the year, depending upon the variation of the ecliptic with that of the equator of the earth. We are of the opinion that the heat of the sun is not so much the radiation of an immense globe of fire within the sun, but rather results from the union of the electricity of the sun with other bodies having an electrical affinity for the sun's electricity. That the brightness of the sun is but the radiance of its own inherent properties possibly uniting with the electrical forces from other bodies, and the heat of the sun results only when the electrical force of the sun unites with another electrical force within some medium with sufficient density to produce a degree of friction and resistance to such electrical union at the points of contact. Consequently the heat of the sun as felt upon the earth results from the resistance produced to the electrical union of what we designate the positive electricity of the sun with the negative electricity of the earth, similar to the production of heat at the point of union of two electrical currents within a substance of less conducting power, as the carbon of the electric light produces both light and heat at the point of contact through the friction it produces with the uniting electrical currents between its molecules.

Thus we claim that when the electrical state of any part of the earth is in a reciprocal relation with the electricity of the sun we will have heat resulting upon the surface of the earth as the result of such electrical union, and when such reciprocal relation does not exist between the electricities of both the earth and the sun we will not have heat produced as there will be no electrical union over such portions of the earth; consequently we may have the heat of summer existing over such portions of the earth as may bear a reciprocal relation to the electricity of the sun while over other portions of the earth not bearing such electrical affinity for the electricity of the sun will have the absence of heat and cold resulting, consequently we have over different portions of the earth's surface the phenomena of winter over one portion while we have summer over another portion of the earth at the same time, all being the result of the variation in the electrical states of the earth over different portions of the earth's surface as already indicated.

Doubtless the phenomena of the Aurora Borealis and the Aurora Australis are each produced, during the winter season of each hemisphere respectively, by the union of electricity within the rays from the sun striking both tangent and near the tangent line uniting with the electricity from the earth along and near the borderline between the unilluminated negative area surrounding the poles respectively and the illuminated area. Thus the negative electrical state of the unilluminated area doubtless extends its electrical influence into the adjacent atmosphere through which the sun's rays pass with the positive electrical influence from the sun, which uniting with that from the negative area of the earth produce a halo of light and heat at the points of contact. This condition prevailing during the winter of the northern hemisphere along the border line of the unilluminated area surrounding the north pole, gives rise to the phenomenon known as the northern lights, called the Aurora Borealis; while the same condition prevailing during the winter season of the southern hemisphere around the unilluminated south pole gives rise to the phenomenon known possibly in the southern hemisphere as southern lights or what is known as the Aurora Australis.

THE APPLICATION OF THE FORCES UPON THE EARTH THAT RESULT IN THE ANNUAL ROTATION OF THE EARTH IN ITS ORBIT AROUND THE SUN.

As already shown during this period of the year, from September 22nd to December 22nd, the negative electrical pole is gradually changed from the southern hemisphere to the northern hemisphere, while at the same time the southern hemisphere gradually acquires a positive electrical pole until the earth reaches a position in its orbit where the electrical states have sufficiently changed in each hemisphere in which the southern hemisphere acquires a preponderance of the repellant force, while the northern hemisphere has likewise acquired a preponderance of the attractive force for the sun. Thus the southern hemisphere begins to be pushed from the sun while the northern hemisphere begins to be pulled toward the sun. Let us now draw a close conception of what will happen. The north pole is held approximately true to its position relative to the celestial center, due to the celestial pull exerted upon the earth, which tends to prevent the now negative north pole from turning about facing the sun. The earth is being revolved upon its axis from west to east with the pushing force exerted over the eastern half of the earth, consequently the pushing force likewise exerted over the southern hemiphere will prevent the earth from passing to the eastward but on the contrary the earth will glide in the direction of least resistance, which will be to the westward, with its north pole being held or slightly pulled by the celestial force while the southern hemisphere like the unattached extremity of a balloon, will be free to take the lead in the direction of movement. As the northern hemisphere contains a preponderance of the landed area of the earth as compared to its surface covered with water, while the southern hemisphere contains a preponderance of water as compared to its landed area, and as areas covered with water are more slowly changed than like surfaces covered with more solid matter as the land, we will have during equal times an unequal change in the relative electrical states of each hemisphere, consequently a difference in the relative pull and push force exerted upon the earth, consequently the northern hemisphere will acquire a pulling force for the sun faster than the southern hemisphere acquires a pushing force from the sun, therefore the slight pull exerted by the celestial center is soon overcome to an extent that the earth if not for the pushing force exerted by the southern hemisphere would tend to be pulled toward the sun. Yet before the southern hemisphere has become fully positive under its slowly forming change we can conceive how the earth would first be drawn nearer the sun, which would result in the earth becoming the more positive, while the negative force would be likewise weakened, this would result in the earth being hurled with greater force from the sun, with the positive forces not centrallizing along the earth's equator, but rather to the southward as the south pole is at this time constantly exposed to the sun's rays and consequently contains the preponderance of positive force. This would force the earth away from the sun to the westward and likewise to the southward, which uniting with the momentum resulting from such movement would tend to cause the earth to continue westward and southward and away from the sun overcoming both the celestial and the solar pulls exerted upon its negative northern hemisphere. (See Plate VI.) The following forces will now act upon the earth to determine its direction of movement: Its forward movement will be produced by its momentum; its repulsion from the sun by the sun exerted over its eastern surface facing the sun, and its repulsion by the sun exerted over its southern hemisphere and more directly over its illuminated south pole now electrically positive along all surfaces subject to constant illumination; while the forces opposing its propulsion, through this its first quadrant, will be the slight controlling pull exerted by the celestial center, the pull exerted by the sun over the western border of the earth facing the sun, and the pull exerted by the sun upon the unilluminated north polar surface and all surfaces electrically negative within its northern hemisphere; therefore the earth will take a direction in obedience to the resultant obtaining from these forces acting upon the earth, which will be toward the sun, yet deflected by the solar push to the westward of the plane connecting the sun, earth and celestial center at the position of the winter solstice. By closely holding the action of all these forces in our mind we can conceive of how the earth will assume a corkscrew motion, turning daily on its axis from west to east while it glides from the direction of the celestial center toward the sun, yet aside to the west-

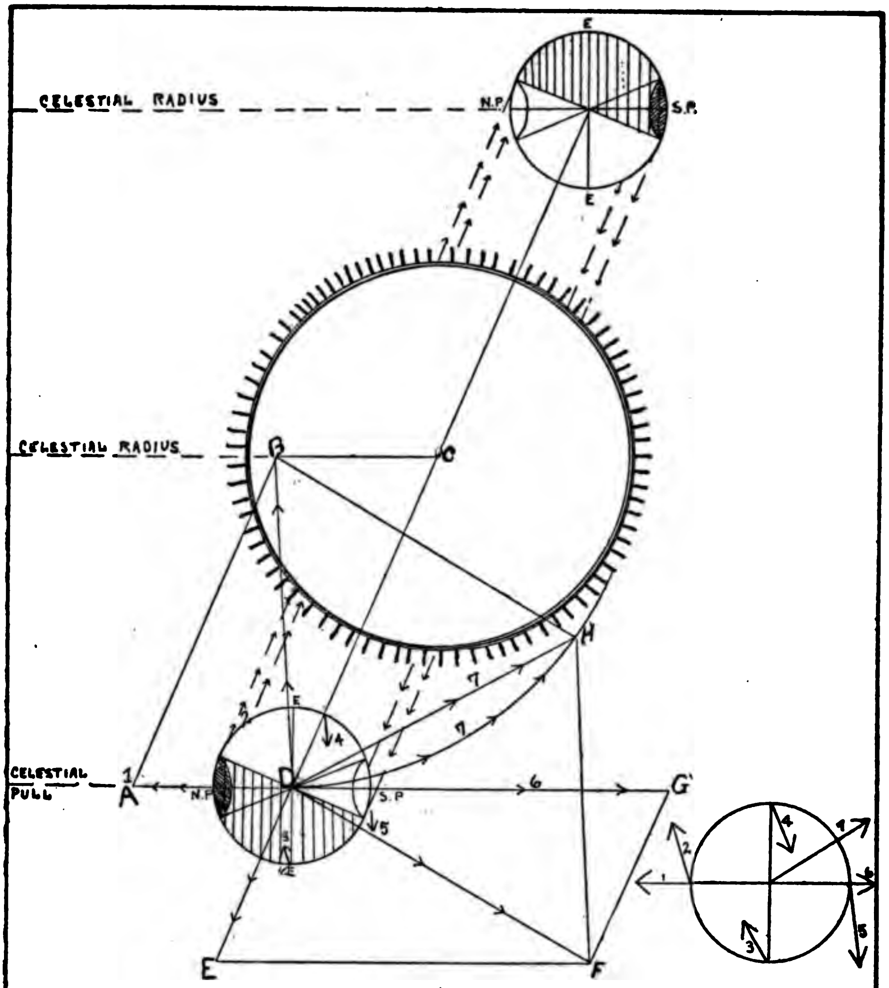

PLATE VI

1 SLIGHT CELESTIAL PULL.

2 SOLAR PULL ON NEGATIVE POLE

3 SOLAR PULL ON NEGATIVE HEMISPHERE IN DIURNAL ROTATION.

4 SOLAR PUSH ON POSITIVE HEMISPHERE IN DIURNAL ROTATION.

5 SOLAR PUSH ON POSITIVE POLE

6 PULL EXERTED BY THE EARTH'S MOMENTUM.

7 FINAL RESULTANT.

GLENN-

ward and to the southward from the sun, on the principle that a boat can be caused to deviate from the direction to which it is being rowed, by a slight pushing force exerted in front of its transverse central line, so the push force is exerted by the sun upon the electrically positive pole of the earth, which at this time is within the southern hemisphere. Thus the earth is caused to glide to the westward and southward and by virtue of its diurnal rotation it is caused to assume an augur-like rotation as it glides through space, traversing its orbit around the sun, in obedience to the resultant of all the forces acting upon its mass.

We will now consider the forces acting upon the earth as it glides in its orbit around the sun. We have assumed that the earth has started from its position occupied at the winter solstice on Dec. 22nd, and glides westward and to the southward from a plane common to the earth, sun and celestial center at the periods of the solstices. We can conceive of the ecliptic and the line of illumination changing upon the earth's surface as the earth passes in its orbit. The ecliptic receding toward the equator and the line of illumination receding toward the poles, along its southern and northern limits. When the line of illumination begins to approach the poles, the area of constant illumination around the south pole and the area of constant unillumination around the north pole begin likewise, to decrease, respectively. As the earth requires approximately 91.315 days to pass through one-fourth of its orbit, it will require that length of time to reach the vernal equinox where the ecliptic will coincide with the equator and the line of illumination will have reached the poles respectively, consequently the line of illumination will have released a ring 15′25″ wide around the outer edges of both the constantly illuminated and the constantly unilluminated areas, each day while the earth is traversing this the first quadrant of its orbit. The areas thus released will each day become subject to alternate exposure to the sun's rays and shadowed by the earth's mass during the following night, while the earth is making its daily revolution upon its axis. Let us endeavor to conceive of the effect of this change upon these newly exposed areas. As each day a ring 15′25″ wide is made subject to the exposure of the sun's rays for a brief space of time while the earth rotates on its axis, this time being but brief at first and increasing as the sun rises higher from the horizon each day, until it reaches a perpendicular on March 21st. This newly exposed area being already electrically negative will consequently possess an affinity for the sun's rays, consequently will tend to drive the negative pole farther northward and intensify the density of the negative electrical force to the northward with a tendency to change such exposed areas each day to a positive electrical state as such area is brought under the direct force of the sun's rays. This area on being rotated to the opposite side, 180° distant from the direct contact of the sun's rays, will rotate in position to receive the negative electrical force that is driven by the force of the sun's rays along lines parallel with the ecliptic, from their points of contact upon the surface of the earth and corresponding to the movement of the winter line northward in accordance with the movement of the ecliptic in approaching the equator. Thus the first day after the earth leaves its winter solstice, the positive force of this ring released 15′25″ north of the arctic circle will be influenced and again changed to a negative force by rays of sunlight falling upon the earth for a distance of 15′25° north of and adjacent to 19°37′ north latitude, which will tend to drive the negative electrical influence of the earth along lines parallel with the ecliptic, which will emerge from the earth if prolonged through the earth, along this ring of 15′25″ north of the arctic circle.

While the line of illumination is releasing each day a ring 15′25″ wide around the outer limits of the unilluminated area surrounding the north pole, it is likewise releasing a similar area around the outer limits of the illuminated area surrounding the south pole. Thus each day a small area is subjected to the shadow of the earth and consequently will acquire such residual negative electricity as may exist within the mass represented by the illuminated area. This negative electrical state will, when rotated under the sun's rays, be driven northward along lines parallel with the ecliptic changing the points of emergence to an electrically negative state. When such electrically negative area shall have rotated under the sun's rays on the succeeding day, the sun's rays will again change such area to a positive state, again driving the negative electrical state northward along lines parallel with the ecliptic and again change the area covering the points of emergence of such lines to an electrically negative state. Thus the electrically negative states of the southern hemisphere will day by day be transferred northward until the lines along which such electrical states pass shall emerge either wholly within the unilluminated area surrounding the north pole or strike a positive area of the earth's mass before such lines shall emerge from the earth. When the latter condition arises then the negative electrical flow will antagonize the positive area of the earth's mass producing heat at their points of union within the earth's interior.

Thus it will be seen, at the time of the winter solstice when the sun's rays strike the earth at an incline of 23°27′40″, that rays striking the earth along the ecliptic along 23°27′40″ south latitude would emerge, if prolonged through the earth, along 23°27′40″ north latitude, were it not for the fact that all that surface of the earth between 19°37′ north latitude and the arctic circle is held electrically positive through the negative electrical influence of the earth's surface between the arctic circle and the north pole, consequently such rays striking the earth along day bring all portions of such area between 66°32′20″ and 19°37′ south latitude under the sun's direct rays. The influence of the sun's rays, as already stated, during the diurnal motion of the earth will change such surface electrically, tending to extend the negative pole through the earth along lines parallel with the ecliptic, which at this season will cause them to emerge 46°55′20″ north of their points of entrance. But the unilluminated area around the north pole will not be exposed to the sun's rays during a diurnal revolution, consequently will not change electrically during the diurnal revolutions of the earth at this period of the year. The negative electrical state being driven northward from the southern hemisphere as already indicated, will be driven to the unilluminated area around the north pole and as this area is not at this time subject to daily change by the diurnal rotation of the earth upon its axis, the negative state of the earth will increase around the north pole within this unilluminated area, consequently not being subject to daily change from negative to positive as is the case with all other portions of the earth now subject to daily changes from day to night, therefore the unilluminated area around the north pole will tend to prevent the daily change of all portions of the earth receiving the sun's rays, that would emerge within this unilluminated area, if prolonged along parallel lines with the ecliptic through the earth; hence the earth's surface between 19°37′ and 66°32′20″ north latitude will be in a measure prevented from daily electrical change and consequently be held electrically opposite in kind from the negative electrical state of the unilluminated area around the north pole, therefore positive in kind, consequently this area of the earth will tend not to reciprocate with the electricity of the positive rays of the sun, consequently a lessening in heat production, hence the winter season of the year. (It being the belief of the writer that there is no heat of itself in the sun, save as heat is produced by contact of the sun's electricity with the electricity from some other body. The sun containing an energy capable of becoming an element of heat. The heat of the sun upon the earth being produced by the sun's electricity coming in contact with the electricity of the earth either within the atmosphere of the earth or upon and within the earth's surface, or by contact both within the atmosphere of the earth and upon and within the earth's surface.) As the earth's surface between latitudes 66°32′20° and 19°37′ south latitude is each day rendered negative, due to the constant positive state of the earth's surface, held so by virtue of the constant exposure to the sun's rays of that portion of the earth's surface between latitudes 66°32′20″ and 90° south latitude, this being the area of constant illumination at this season of the year, therefore the positive electrical state of the sun's rays have a reciprocal relation to the negative electrical state of that portion of the earth's surface between augment the other more and more each day until the earth reaches the position of its summer solstice on June 21st. Thus it will be seen that the solar pull and the celestial pull antagonize each other while the earth is passing approximately through its first quadrant from December 22nd until March 21st when the two forces act approximately at right angles, after which time they each assist the other while the earth is passing through the second quadrant of its orbit. The earth on reaching the end of the first quadrant of its orbit arrives at a position where the ecliptic now coincides with the equator; the line of illumination now passes through each pole and the days and nights are equal upon all parts of the earth's surface. The moment that the earth passes this point in its orbit, called the Vernal Equinox, the ecliptic passes to the north of the equator and the line of illumination leaves the south pole unilluminated and passes northward while it passes beyond the north pole to the southward on the opposite side of the earth from the direction of the sun leaving the north pole exposed to constant illumination by the sun. By virtue of this change in position of the earth relative to the sun, the lines extended from the earth to the sun and from the earth to the celestial center will now produce an acute angle at their point of junction at the earth's center. Consequently the legs of the angle will tend to approach each other as the earth swings in its orbit away from the position of the vernal equinox, therefore the celestial pull will tend to assist the solar pull for the earth, at first but slightly and increasing daily as the earth swings farther from the vernal equinox while the lines of pull are approaching each other. Thus partially combining the solar and the celestial pulls for the earth would tend to overcome the pushing force of the sun for the southern hemisphere of the earth and cause the earth to swing in its orbit approaching the sun, were it not for the fact that the southern hemisphere changes its electrical state more slowly than does the northern hemisphere, as the southern hemisphere contains a great preponderance of water over the northern hemisphere. It must be kept in mind that as the poles changed their relation to the sun's rays, they each began to change their respective electrical states and each hemisphere likewise. The difference in the relative land and water surfaces upon each hemisphere produces a like difference in the rate of their electrical changes. Thus the northern hemisphere changes from a negative to a positive state more rapidly than the southern hemisphere changes from a positive to a negative state, thus the pulling force of the sun for the northern hemisphere tends to become gradually annulled while the pushing force of the sun for the positive electrified southern hemisphere remains with its pushing force in a less degree gradually lessening in activity to become annulled at a later period. The lessening of the pulling force of the sun for the northern hemisphere of the earth leaves the earth to be principally influenced by the resultant between the solar pushing force remaining in the southern hemisphere and the celestial pull for the earth, which both incline to carry the earth farther southward and to pull the earth toward the solstitial plane and celestial center, which holds the earth with its north pole inclined to the celestial center, by virtue of the increased specific gravity of the northern hemisphere over the southern hemisphere, the celestial pull holding the earth and exerting a guiding influence over the earth as the boy controls his balloon or kite by the attached string that he holds; thus as an elastic cord the celestial pull exerts its guiding influence over the direction of the earth in its orbit as it swings in space influenced by its own momentum and the relative degree of pull and push force exerted over the respective hemispheres, with the variations in these forces over the earth influenced by the positions of the earth and conditions existing therein.

We have stated that the pull and push force have gradually ceased while the earth swings in its orbit through its second quadrant from March 21st to June 21st. Let us now consider why these forces have ceased in their action and note the reasons for such changes. When the earth passed the Vernal Equinox, its southern hemisphere was electrified with a positive electrical force while its northern hemisphere was electrified with a negative electrical force. The moment that the ecliptic passed north of the equator, that moment the line of illumination passed beyond the north pole southward while it passed from the south pole on the illuminated side of the earth northward, thus exposing the north pole to constant illumination while it left the south pole in constant darkness. The areas around each pole are equal. The areas increasing each day as the earth travels in its orbit and the ecliptic travels northward and the line of illumination passes farther from each pole. The now changed condition of having a constantly exposed area to the sun's rays around the north pole and an equally large constantly unexposed area around the south pole gave rise to a new electrical change in each hemisphere. The moment that the northern hemisphere was thrown in position to constantly expose an area around its north pole, that moment the electricity from the sun began to neutralize the electrical force of the earth at that point and cause it to change its negative force with its affinity for the sun's rays to a positive force like that of the sun with no affinity but having a repellant force for the sun. As the sun's rays falling along the line of the ecliptic would emerge, if prolonged through the earth, just the same distance south of the equator that the line of the ecliptic may have passed north of the equator, so would rays of the sun parallel with the ecliptic falling upon any portion of the earth's surface make a like inclination and emerge, if prolonged through the earth, just as far south of their points of entrance as does the sun's rays falling along the line of the ecliptic emerge south of their points of entrance, such points being the electrical antipodes. Therefore the tendency of the constantly exposed area around the north pole to change its electrical affinity to a repulsion for the sun would cause the area upon the earth's surface along which those lines would emerge if prolonged representing their electrical antipodes, to become electrically opposite to the electrical state of the constantly exposed positive area, which would incline such surface to become electrically negative with an affinity for the sun. The constant rotation of the earth upon its axis brings each portion of such area directly under the contact of the sun's rays every twenty-four hours. This exposure will tend to change the electrical state of such surface and drive the negative force with the same inclination southward, with points exposed to the sun's rays positive and the points of emergence of those rays, if prolonged through the earth, negative, having an affinity for the sun's rays, which when again rotated under the sun's rays, by the diurnal motion of the earth will be again changed to positive having a repellent force for the sun while the sun's rays if prolonged through the earth could emerge with the same inclination southward changing the electrical state of that new surface to negative as the sun's rays had made like changes on the previous day, as we have just considered. Thus the tendency is day by day to drive the negative state from northward to southward until it finally reaches the unilluminated area around the south pole, when that unexposed surface is reached the negative state having an affinity for the sun's rays is not changed over that unexposed area during the diurnal rotation of the earth as the sun's rays at no time reach that area to produce a change in the electrical state of such area; therefore the unexposed area around the south pole begins to accumulate a negative electrical state or pole which has an affinity for the sun's rays, while an equally large area around the north pole is being changed to a positive electrical state or pole having a repellant force for the sun. Thus it is as day by day the earth travels in its orbit and the line of the ecliptic travels from the equator and the line of illumination travels from the poles, leaving each day a constantly increasing area around each pole with as constantly an increasing force with its respective relation for the forces of the sun around each pole, until that condition is reached in which the northern hemisphere is no longer attracted to the sun and the southern hemisphere is no longer repelled from the sun. The point is now reached in which the southern hemisphere begins to be drawn to the sun and the northern hemisphere begins to be repelled from the sun.

Thus the electrical state of each hemisphere is gradually changed and consequently the earth is caused to change its general direction relative to the celestial center as it swings in its elliptical course within its orbit, this change being produced after each equinox. In reaching this change after the vernal equinox relative to the equator the ecliptic has traveled northward to 23°27′40″. This position is reached on June 21st, the earth has reached its farthest point from the celestial center in its orbit, this point being called the summer solstice.

As the earth approaches the summer solstice on June 21st it reaches an electrical state in which the southern hemisphere no longer repels and the northern hemisphere no longer exerts a pulling force for the sun, but for the time the electrical state in each hemisphere is about equally balanced between the negative and the positive electrical forces existing in each. (See Plate VII.) The earth for the time being occupies in each hemisphere an electrical balance, and being acted upon by the celestial pull would tend to be pulled into the sun as the earth passes the solstitial plane were it not for the momentum of the earth which carries it apast the solstitial plane to the eastward, so that the resultant is a course approaching the sun, yet receding to the eastward from the sun. As the northern hemisphere was the first to lose its pulling force for the sun while the earth was passing through its second quadrant, so it becomes the first to regain its pushing force from the sun after changing the electrical states around each pole as already shown, after entering the third quadrant of its orbit. Consequently as the force of the momentum will tend to become checked and nullified by the pull force from the celestial center, the positive electrical state of the northern hemisphere will assume the work of the losing force from the momentum of the earth and exert a repellant force for the sun which thus checks the celestial pull from drawing the earth toward the sun. Thus the earth will take a circular course around the sun on entering its third quadrant in its orbit and be hurled to the eastward while it is pursuing its course to the northward. The rapidity with which the northern hemisphere with its great preponderance of land area will acquire a repelling force for the sun would soon increase with such rapidity as to greatly overcome the celestial pull and consequently throw the earth much to the eastward in its course were it not for the increasing solar pull that the southern hemisphere is now slowly acquiring due to the great preponderance of water areas over those of its land areas, which united with the celestial pull tends to hold the solar push for the northern hemisphere in check to an extent that the earth is prevented from being pushed too far eastward from the sun and caused to float northward around to the east of the sun while traversing the third quadrant in its orbit from June 21st to Sept. 22nd. Thus the forces combined to influence the course of the earth in its orbit around the sun while traversing its third quadrant.

If on March 21st and Sept. 22nd lines could be drawn from the center of the sun to both the earth and the celestial center, an approxi-

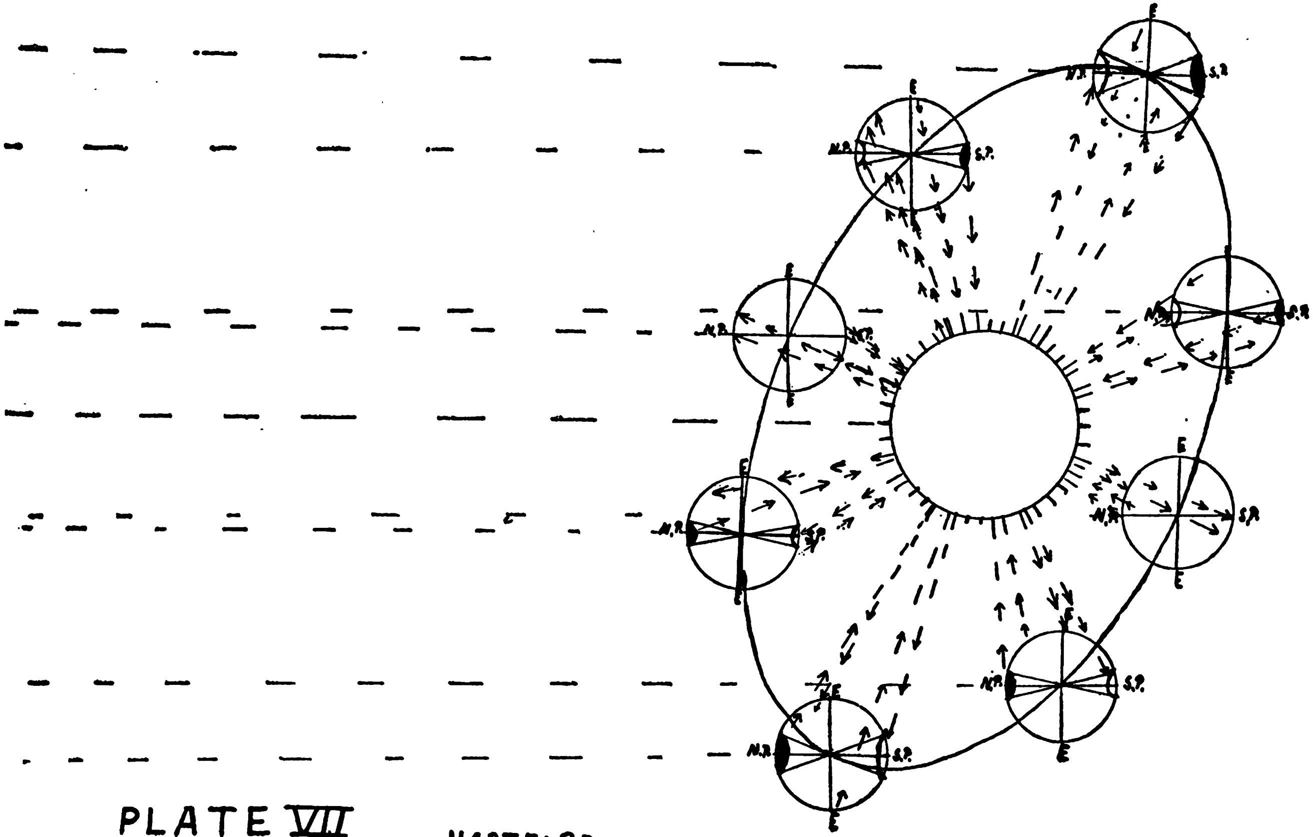

PLATE VII HARTFORD

mate rightangled triangle would be formed in each case with the sun at the righangle. The distance from the sun to the earth would form the base of the triangle, while the distance from the sun to the celestial center would form the perpendicular, and the distance from the earth to the celestial center would form the hypotenuse of the triangle. If a plane were passed from the celestial center, through the sun and earth at the solstices, it would cut the earth's orbit at the solstitial points. If a plane were passed through the sun and earth, at the equinoxes, it would pass perpendicular to the plane passing through the solstitial points. The earth's orbit would incline to recede from the celestial center in an elliptical course while traversing the course through the first and second quadrants, then incline toward the celestial center while traversing the third and fourth quadrants due to the change in the forces as already enumerated.

While the earth is passing through the third quadrant of its orbit from June 21st to September 22nd, it undergoes similar electrical changes, only in a reverse order, that it undergoes while passing through the first quadrant of its orbit from December 22nd to March 21st. Thus while the positive electrical movement of the earth is from the north pole and northern hemisphere to the south pole and the southern hemisphere while the earth is passing through its fourth and first quadrants in its orbit from September 22nd to March 21st, it likewise moves from the south pole and southern hemisphere to the north pole and the northern hemisphere while the earth is passing through the second and third quadrants in its orbit from March 21st to September 22nd.

While the earth is passing through the first quadrant of its orbit from December 22nd to March 21st and through the third quadrant of its orbit from June 21st to September 22nd the poles of the earth do not change electrically, but rather the electrical state around each pole and throughout each hemisphere is constantly intensified until the maximum electrical state is reached on reaching the next succeeding equinoctial point. Thus we observe that, while the earth is passing through the succeeding quadrant of its orbit after passing an equinoctial point and approaches the next succeeding solstitial point, each pole and each hemisphere of the earth undergoes an electrical change from positive to negative or from negative to positive as the case may be, according to the position of the earth in its orbit and the position of the sun to each hemisphere respectively; also we observe that the earth after passing a solstitial point in its orbit does not change electrically but intensifies the electrical state already existing until it reaches the next succeeding equinoctial point in its orbit, when an electrical change begins to take place. Thus while the earth is passing through its first quadrant there is an intensifying of the electrical rotate in position to receive the negative electrical force that is driven by the force of the sun's rays along lines parallel with the ecliptic, from their points of contact upon the surface of the earth and corresponding to the movement of the winter line northward in accordance with the movement of the ecliptic in approaching the equator. Thus the first day after the earth leaves its winter solstice, the positive force of this ring released 15′25″ north of the arctic circle will be influenced and again changed to a negative force by rays of sunlight falling upon the earth for a distance of 15′25° north of and adjacent to 19°37′ north latitude, which will tend to drive the negative electrical influence of the earth along lines parallel with the ecliptic, which will emerge from the earth if prolonged through the earth, along this ring of 15′25″ north of the arctic circle.

While the line of illumination is releasing each day a ring 15′25″ wide around the outer limits of the unilluminated area surrounding the north pole, it is likewise releasing a similar area around the outer limits of the illuminated area surrounding the south pole. Thus each day a small area is subjected to the shadow of the earth and consequently will acquire such residual negative electricity as may exist within the mass represented by the illuminated area. This negative electrical state will, when rotated under the sun's rays, be driven northward along lines parallel with the ecliptic changing the points of emergence to an electrically negative state. When such electrically negative area shall have rotated under the sun's rays on the succeeding day, the sun's rays will again change such area to a positive state, again driving the negative electrical state northward along lines parallel with the ecliptic and again change the area covering the points of emergence of such lines to an electrically negative state. Thus the electrically negative states of the southern hemisphere will day by day be transferred northward until the lines along which such electrical states pass shall emerge either wholly within the unilluminated area surrounding the north pole or strike a positive area of the earth's mass before such lines shall emerge from the earth. When the latter condition arises then the negative electrical flow will antagonize the positive area of the earth's mass producing heat at their points of union within the earth's interior.

Thus it will be seen, at the time of the winter solstice when the sun's rays strike the earth at an incline of 23°27′40″, that rays striking the earth along the ecliptic along 23°27′40″ south latitude would emerge, if prolonged through the earth, along 23°27′40″ north latitude, were it not for the fact that all that surface of the earth between 19°37′ north latitude and the arctic circle is held electrically positive through the negative electrical influence of the earth's surface between the arctic circle and the north pole, consequently such rays striking the earth along the line of the ecliptic on the period of winter solstice will before emerging strike the area held positive through the negative influence of the unilluminated area. As the point of contact of negative and positive electricity will produce heat in any substance that does not become a ready conductor or in any way prevents absolute contact, there will be heat produced within the interior of the earth at such points of electrical union.

Thus the conical cap held positive through the influence of the unilluminated area will cover a cone of negative electricity within the interior of the earth, which as the earth swings in its orbit day by day lifting the influence of the winter line, or influence producing winter, in the northern hemisphere and exposing more and more of the southern limits of such area to electrical change, the negative cone within the earth will be likewise enlarged and progress farther and farther northward, all the while intensifying the negative electrical state within the northern hemisphere while the southern hemisphere is being depleted of its negative electricity remaining at the time of the winter solstice, while the southern hemisphere is becoming electrically more and more positive. Consequently, by the time the vernal equinox is reached on March 21st and the first quadrant of the earth is completed the northern hemisphere has reached its maximum negative electrical state while the southern hemisphere has reached its maximum positive electrical state. The northern hemisphere has attained its greatest pulling force toward the sun while the southern hemisphere has attained its greatest pushing force from the sun.

If a diagram be drawn illustrating the positions of the earth, sun and celestial center at the time of the earth's leaving the position of the winter solstice on December 22nd, it will be seen that the lines connecting the earth and the sun and the earth and the celestial center will show that their respective pulls tend to oppose each other, that is the celestial pull will tend to weaken the solar pull for the earth. As the earth swings to the westward and southward in its orbit it will be seen how the lines of pull exerted upon the earth by both the sun and the celestial center respectively will incline to approach each other, the angle formed at the earth, by the junction of each line, becoming less and less obtuse, until at some time before the earth has reached the vernal equinox the lines become perpendicular to each other, after which time as the earth swings farther southward each day the angle formed by the junction of the lines connecting earth and sun and earth and celestial center will form an acute angle that becomes more and more acute each day as the earth swings farther and farther southward in its orbit, consequently the pulling force exerted by the celestial center and the sun upon the earth will cease to further antagonize each other, but instead will now tend to each augment the other more and more each day until the earth reaches the position of its summer solstice on June 21st. Thus it will be seen that the solar pull and the celestial pull antagonize each other while the earth is passing approximately through its first quadrant from December 22nd until March 21st when the two forces act approximately at right angles, after which time they each assist the other while the earth is passing through the second quadrant of its orbit. The earth on reaching the end of the first quadrant of its orbit arrives at a position where the ecliptic now coincides with the equator; the line of illumination now passes through each pole and the days and nights are equal upon all parts of the earth's surface. The moment that the earth passes this point in its orbit, called the Vernal Equinox, the ecliptic passes to the north of the equator and the line of illumination leaves the south pole unilluminated and passes northward while it passes beyond the north pole to the southward on the opposite side of the earth from the direction of the sun leaving the north pole exposed to constant illumination by the sun. By virtue of this change in position of the earth relative to the sun, the lines extended from the earth to the sun and from the earth to the celestial center will now produce an acute angle at their point of junction at the earth's center. Consequently the legs of the angle will tend to approach each other as the earth swings in its orbit away from the position of the vernal equinox, therefore the celestial pull will tend to assist the solar pull for the earth, at first but slightly and increasing daily as the earth swings farther from the vernal equinox while the lines of pull are approaching each other. Thus partially combining the solar and the celestial pulls for the earth would tend to overcome the pushing force of the sun for the southern hemisphere of the earth and cause the earth to swing in its orbit approaching the sun, were it not for the fact that the southern hemisphere changes its electrical state more slowly than does the northern hemisphere, as the southern hemisphere contains a great preponderance of water over the northern hemisphere. It must be kept in mind that as the poles changed their relation to the sun's rays, they each began to change their respective electrical states and each hemisphere likewise. The difference in the relative land and water surfaces upon each hemisphere produces a like difference in the rate of their electrical changes. Thus the northern hemisphere changes from a negative to a positive state more rapidly than the southern hemisphere changes from a positive to a negative state, thus the pulling force of the sun for the northern hemisphere tends to become gradually annulled while the pushing force of the sun for the positive electrified southern hemisphere remains with its pushing force in a less degree gradually lessening in activity to become annulled at a later period. The lessening of the pulling force of the sun for the northern hemisphere of the earth leaves the earth to be principally influenced by the resultant between the solar pushing force remaining in the southern hemisphere and the celestial pull for the earth, which both incline to carry the earth farther southward and to pull the earth toward the solstitial plane and celestial center, which holds the earth with its north pole inclined to the celestial center, by virtue of the increased specific gravity of the northern hemisphere over the southern hemisphere, the celestial pull holding the earth and exerting a guiding influence over the earth as the boy controls his balloon or kite by the attached string that he holds; thus as an elastic cord the celestial pull exerts its guiding influence over the direction of the earth in its orbit as it swings in space influenced by its own momentum and the relative degree of pull and push force exerted over the respective hemispheres, with the variations in these forces over the earth influenced by the positions of the earth and conditions existing therein.

We have stated that the pull and push force have gradually ceased while the earth swings in its orbit through its second quadrant from March 21st to June 21st. Let us now consider why these forces have ceased in their action and note the reasons for such changes. When the earth passed the Vernal Equinox, its southern hemisphere was electrified with a positive electrical force while its northern hemisphere was electrified with a negative electrical force. The moment that the ecliptic passed north of the equator, that moment the line of illumination passed beyond the north pole southward while it passed from the south pole on the illuminated side of the earth northward, thus exposing the north pole to constant illumination while it left the south pole in constant darkness. The areas around each pole are equal. The areas increasing each day as the earth travels in its orbit and the ecliptic travels northward and the line of illumination passes farther from each pole. The now changed condition of having a constantly exposed area to the sun's rays around the north pole and an equally large constantly unexposed area around the south pole gave rise to a new electrical change in each hemisphere. The moment that the northern hemisphere was thrown in position to constantly expose an area around its north pole, that moment the electricity from the sun began to neutralize the electrical force of the earth at that point and cause it to change its negative force with its affinity for the sun's rays to a positive force like that of the sun with no affinity but having a repellant force for the sun. As the sun's rays falling along the line of the ecliptic would emerge, if prolonged through the earth, just the same distance south of the equator that the line of the ecliptic may have passed north of the equator, so would rays of the sun parallel with the ecliptic falling upon any portion of the earth's surface make a like inclination and emerge, if prolonged through the earth, just as far south of their points of entrance as does the sun's rays falling along the line of the ecliptic emerge south of their points of entrance, such points being the electrical antipodes. Therefore the tendency of the constantly exposed area around the north pole to change its electrical affinity to a repulsion for the sun would cause the area upon the earth's surface along which those lines would emerge if prolonged representing their electrical antipodes, to become electrically opposite to the electrical state of the constantly exposed positive area, which would incline such surface to become electrically negative with an affinity for the sun. The constant rotation of the earth upon its axis brings each portion of such area directly under the contact of the sun's rays every twenty-four hours. This exposure will tend to change the electrical state of such surface and drive the negative force with the same inclination southward, with points exposed to the sun's rays positive and the points of emergence of those rays, if prolonged through the earth, negative, having an affinity for the sun's rays, which when again rotated under the sun's rays, by the diurnal motion of the earth will be again changed to positive having a repellent force for the sun while the sun's rays if prolonged through the earth could emerge with the same inclination southward changing the electrical state of that new surface to negative as the sun's rays had made like changes on the previous day, as we have just considered. Thus the tendency is day by day to drive the negative state from northward to southward until it finally reaches the unilluminated area around the south pole, when that unexposed surface is reached the negative state having an affinity for the sun's rays is not changed over that unexposed area during the diurnal rotation of the earth as the sun's rays at no time reach that area to produce a change in the electrical state of such area; therefore the unexposed area around the south pole begins to accumulate a negative electrical state or pole which has an affinity for the sun's rays, while an equally large area around the north pole is being changed to a positive electrical state or pole having a repellant force for the sun. Thus it is as day by day the earth travels in its orbit and the line of the ecliptic travels from the equator and the line of illumination travels from the poles, leaving each day a constantly increasing area around each pole with as constantly an increasing force with its respective relation for the forces of the sun around each pole, until that condition is reached in which the northern hemisphere is no longer attracted to the sun and the southern hemisphere is no longer repelled from the sun. The point is now reached in which the southern hemisphere begins to be drawn to the sun and the northern hemisphere begins to be repelled from the sun.

Thus the electrical state of each hemisphere is gradually changed and consequently the earth is caused to change its general direction relative to the celestial center as it swings in its elliptical course within its orbit, this change being produced after each equinox. In reaching this change after the vernal equinox relative to the equator the ecliptic has traveled northward to 23°27′40″. This position is reached on June 21st, the earth has reached its farthest point from the celestial center in its orbit, this point being called the summer solstice.

As the earth approaches the summer solstice on June 21st it reaches an electrical state in which the southern hemisphere no longer repels and the northern hemisphere no longer exerts a pulling force for the sun, but for the time the electrical state in each hemisphere is about equally balanced between the negative and the positive electrical forces existing in each. (See Plate VII.) The earth for the time being occupies in each hemisphere an electrical balance, and being acted upon by the celestial pull would tend to be pulled into the sun as the earth passes the solstitial plane were it not for the momentum of the earth which carries it apast the solstitial plane to the eastward, so that the resultant is a course approaching the sun, yet receding to the eastward from the sun. As the northern hemisphere was the first to lose its pulling force for the sun while the earth was passing through its second quadrant, so it becomes the first to regain its pushing force from the sun after changing the electrical states around each pole as already shown, after entering the third quadrant of its orbit. Consequently as the force of the momentum will tend to become checked and nullified by the pull force from the celestial center, the positive electrical state of the northern hemisphere will assume the work of the losing force from the momentum of the earth and exert a repellant force for the sun which thus checks the celestial pull from drawing the earth toward the sun. Thus the earth will take a circular course around the sun on entering its third quadrant in its orbit and be hurled to the eastward while it is pursuing its course to the northward. The rapidity with which the northern hemisphere with its great preponderance of land area will acquire a repelling force for the sun would soon increase with such rapidity as to greatly overcome the celestial pull and consequently throw the earth much to the eastward in its course were it not for the increasing solar pull that the southern hemisphere is now slowly acquiring due to the great preponderance of water areas over those of its land areas, which united with the celestial pull tends to hold the solar push for the northern hemisphere in check to an extent that the earth is prevented from being pushed too far eastward from the sun and caused to float northward around to the east of the sun while traversing the third quadrant in its orbit from June 21st to Sept. 22nd. Thus the forces combined to influence the course of the earth in its orbit around the sun while traversing its third quadrant.

If on March 21st and Sept. 22nd lines could be drawn from the center of the sun to both the earth and the celestial center, an approxi-

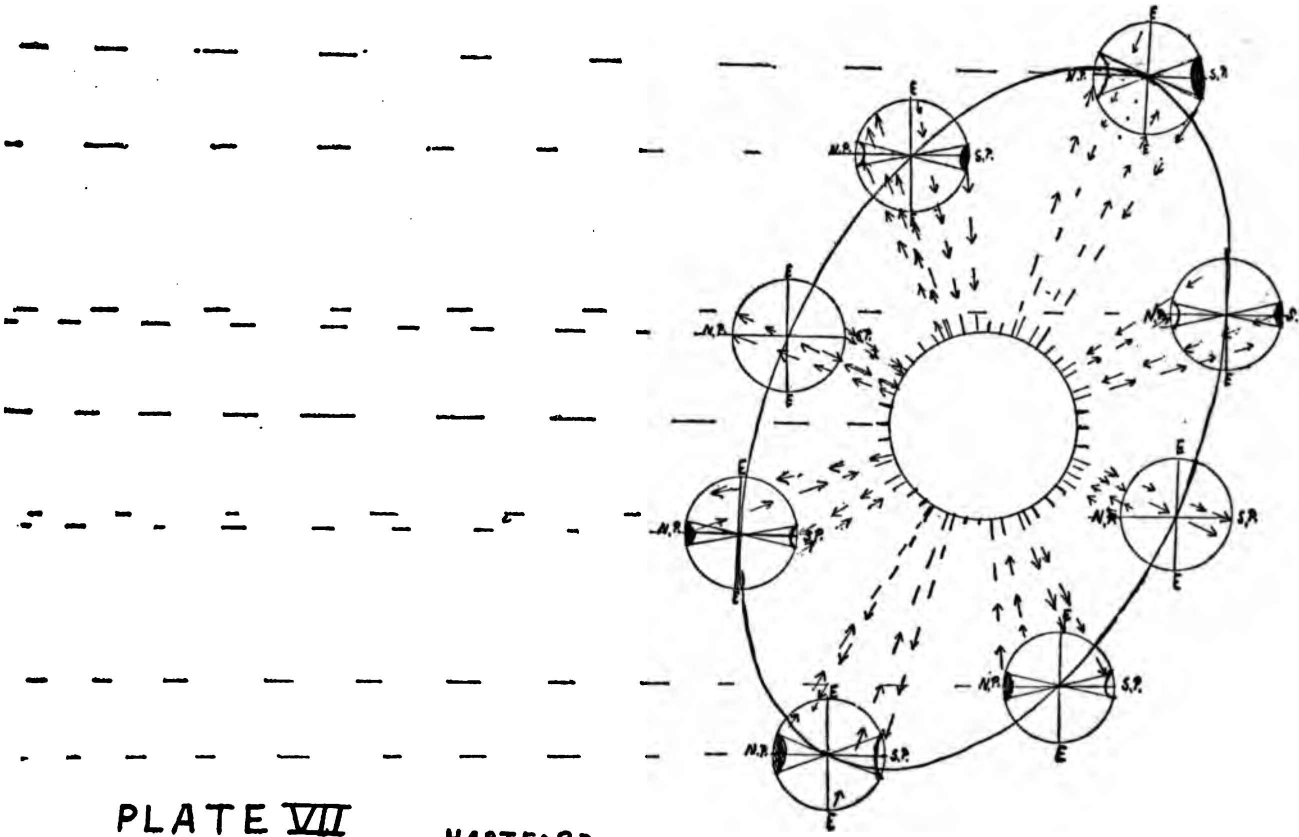

PLATE VII

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mate rightangled triangle would be formed in each case with the sun at the righangle. The distance from the sun to the earth would form the base of the triangle, while the distance from the sun to the celestial center would form the perpendicular, and the distance from the earth to the celestial center would form the hypotenuse of the triangle. If a plane were passed from the celestial center, through the sun and earth at the solstices, it would cut the earth's orbit at the solstitial points. If a plane were passed through the sun and earth, at the equinoxes, it would pass perpendicular to the plane passing through the solstitial points. The earth's orbit would incline to recede from the celestial center in an elliptical course while traversing the course through the first and second quadrants, then incline toward the celestial center while traversing the third and fourth quadrants due to the change in the forces as already enumerated.

While the earth is passing through the third quadrant of its orbit from June 21st to September 22nd, it undergoes similar electrical changes, only in a reverse order, that it undergoes while passing through the first quadrant of its orbit from December 22nd to March 21st. Thus while the positive electrical movement of the earth is from the north pole and northern hemisphere to the south pole and the southern hemisphere while the earth is passing through its fourth and first quadrants in its orbit from September 22nd to March 21st, it likewise moves from the south pole and southern hemisphere to the north pole and the northern hemisphere while the earth is passing through the second and third quadrants in its orbit from March 21st to September 22nd.

While the earth is passing through the first quadrant of its orbit from December 22nd to March 21st and through the third quadrant of its orbit from June 21st to September 22nd the poles of the earth do not change electrically, but rather the electrical state around each pole and throughout each hemisphere is constantly intensified until the maximum electrical state is reached on reaching the next succeeding equinoctial point. Thus we observe that, while the earth is passing through the succeeding quadrant of its orbit after passing an equinoctial point and approaches the next succeeding solstitial point, each pole and each hemisphere of the earth undergoes an electrical change from positive to negative or from negative to positive as the case may be, according to the position of the earth in its orbit and the position of the sun to each hemisphere respectively; also we observe that the earth after passing a solstitial point in its orbit does not change electrically but intensifies the electrical state already existing until it reaches the next succeeding equinoctial point in its orbit, when an electrical change begins to take place. Thus while the earth is passing through its first quadrant there is an intensifying of the electrical state, the northern hemisphere becoming more negative while the southern hemisphere is becoming more positive; so it is only in a reverse order while the earth is passing through its third quadrant, the remaining negative electricity is being driven from the northern hemisphere to the southern hemisphere and intensifying the negative state within the southern hemisphere, while the northern hemisphere is drawing the positive electricity from the southern hemisphere and is becoming more positive, as the earth swings farther each day to the northward, with its northern hemisphere and north pole facing the direct rays of the sun. Thus the earth sweeps past the autumnal equinox on Sept. 22nd with its southern hemisphere at its maximum negative state while its northern hemisphere is at its maximum positive state, the northern hemisphere repelling the sun while the southern hemisphere is being pulled to the sun. Were it not for the celestial pull the earth would turn about with its northern hemisphere pointing from the sun while its southern hemisphere would face the sun for the time being. The celestial pull prevents any such action and by holding the north pole true to its direction it causes the earth to be drawn toward the solstitial plane. The pull of the sun for the southern hemisphere now antagonizes the celestial pull for the earth, while the pushing force of the sun for the northern hemisphere of the earth combines with the celestial pull for the earth and thus holds the earth from the sun while it swings around the sun outlining its course within and throughout the fourth quadrant of its orbit.

The moment the earth passes its autumnal equinox, that moment the north pole ceases to receive constant illumination from the sun as it has been since it passed the vernal equinox on the previous March 21st, while the south pole becomes exposed to the constant rays of the sun while it is lifted from the earth's shadow, that has enveloped it since the passage of the vernal equinox on the previous March 21st, consequently the electrical poles will begin to change positions with the negative electrical force beginning to gather about the north pole while the positive electrical force will begin to gather around the south pole, due to the change in exposure of each pole respectively to constant sunlight and shadow as already explained in our description of the change of electrical poles while the earth passed through its second quadrant from March 21st to June 21st. The electrical change that each hemisphere now undergoes, while the earth passes through its fourth quadrant, from September 22nd to December 22nd, will soon become manifested in the respective pulling and pushing force that each hemisphere respectively receives from the sun; while the readiness with which the northern hemisphere changes electrically as compared to that of the southern hemisphere will cause the northern hemisphere to part with its electrically positive force and take on an electrically negative force at a more rapid rate than does the southern hemisphere part with its electrically negative force and take on an electrically positive force; therefore the northern hemisphere will cease to be pushed from the sun and begin to be drawn to the sun, or in other words reach its electrical balance before the southern hemisphere likewise reaches its electrical balance and cease to be drawn by the sun and begin to be pushed by the sun; therefore the southern hemisphere will for a short period of time still exert a drawing force for the sun while the newly acquired electrically negative force in the northern hemisphere will combine with the remaining electrically negative force before the electrical balance is reached in the southern hemisphere and while such forces are so combined cause the earth to be pulled nearer the sun against the celestial pull exerted upon the earth, thus causing the earth to approach nearer the sun by the time the earth reaches its winter solstice or perihelion than the earth approached the sun at the time of its summer solstice or aphelion. The earth thus approaches the sun at the time of its winter solstice about 3,000,000 miles nearer than it approaches the sun at the time of its summer solstice.

Possibly the electrical balance in the northern hemisphere takes place just prior to the earth reaching its perihelion, while the electrical balance in the southern hemisphere possibly is deferred until the earth has reached its perihelion; therefore the earth is as a whole in about a neutral electrical state just prior and at the time the earth passes its perihelion, similar to yet reversed as to position of the respective electrical forces that the earth undergoes about the time the earth passes its aphelion.

In this state the earth sweeps apast the solistitial plane on December 22nd influenced for the time by its celestial pull and the earth's momentum, which becomes no small factor when we consider that the earth sweeps through space at the rate of some 1,600,000 miles per day, thus like the fly wheel to the engine prevents any marked deviation by any temporary cessation of forces, so the momentum of the earth prevents any marked deviation in its course from any slight influence, while on the other hand it inclines to preserve a more uniform rate of travel while the earth is making its various electrical changes in traversing its orbit around the sun. The celestial pull would soon overcome the momentum of the earth and begin to draw the earth toward the celestial center, were it not for the readily changing northern hemisphere now coming to the rescue and beginning to exert a pull toward the sun. It will be seen that the readiness with which the northern hemisphere changes its state electrically as compared to the more slowly changing southern hemsphere, as has been explained, now becomes an active factor in preventing the earth from markedly deviating from its course and becoming active sets to work to hold the earth to the sun and thus overcoming the celestial pull tends to draw the earth toward the sun, which it would do to a marked degree were it not for the tendency of the momentum of the earth to prevent any rapid and marked deviation, before the solar push becomes established within the southern hemisphere, which becomes active more slowly than the northern hemisphere, yet in due time to unite with the celestial pull in causing the earth to take a more westernly course in its orbit, encircling the sun while it floats to the westward and southward around the sun in obedience to the resultant force acting uniformly from the combined forces acting upon the earth's mass, as already enumerated. (See plates VI. and VII.) Thus the earth moves in its orbit around the sun in obedience to the resultant force ever acting upon its mass. The resultant represents the combined force from the celestial attraction; the attractive and the repellant forces, as enumerated, from the sun, acting alternately upon the hemispheres of the earth; and lastly, the momentum of the earth serving to preserve the uniformity of movement, throughout the earth's orbit and most especially during the electrical changes while the attractive and the repellant forces of the sun for the earth are passing their balance point in changing from one hemisphere to the other.

The writer has developed this conception of the movements of the earth from thoughts that have formed a nidus for investigation, that have been suggested to his mind from a higher source, while the mind has apparently become lost in that mental reflection, that loses itself to the world and the authorities of mankind and becomes transformed into a state where suggestions coming apparently intuitively from the omniscient mind of God are taken by the writer and developed according to such knowledge and powers of reason as possessed by the finite mind of the writer, assisted as he feels and trusts by the ever present spirit of Almighty God.

CHAPTER IV.

THE ELECTRICAL RELATION OF THE EARTH TO THE SUN.

(See Plate VIII.)

The writer takes the position that the solar rays influencing the earth in an electrical sense are those rays that directly connect the dynamic portion of the sun with the earth, hence are those rays that mark the shortest distance between the earth and the sun. The sun being distant from the earth about 93,000,000 of miles and being about 866,500 miles in diameter while the earth is but about 8000 miles in diameter; hence rays of light falling directly as dynamic rays upon the earth are those that pass directly between the earth and the sun, coming from about 8,000 miles of the sun's surface at one time. The most distant rays being those tangent to the earth's surface, outlining the line of illumination upon the earth's surface.

But it must be observed that the earth does not draw continuously from any one portion of the sun, as the earth being in motion and traveling at the rate of over 1,600,000 miles each day of 24 hours each makes a corresponding change in position relative to the surface of the sun. The sun being some 866,500 miles in diameter is consequently some 2,534,165 miles in circumference. The earth while coursing through its orbit passes once around the sun each circuit and thus passes over the entire circumference of the sun, which will cause the earth to pass over the surface of the sun, making some 4 and 4-5 miles per minute, about 289 miles each hour, and about 6936 miles per day of a constant change upon the surface of the sun. Thus the earth does not draw constantly from any one portion of the sun's surface but is at all times changing upon the sun's surface to correspond to the change in position of the earth in its own orbit.

Thus change in the position of the earth relative to the surface of the sun subjects the earth's surface to be influenced constantly by a new portion of the sun's surface; in this manner establishing a constant change of the electrical relation between both bodies and thus preventing the sun from becoming changed as to its positive electrical state relative to the earth. Thus it becomes possible for the sun to remain constantly electrically positive to the earth and for the earth to be at all times subject to a constant electrical renewal from the sun's positive electrical force.

It may be true that we have oblique rays from the sun but they fail in being dynamic, being rather of the nature of reflected light rather than a dynamic wave force, as are the direct rays of the sun directly connecting the earth and the sun. The earth is then influenced more directly by the shortest direct rays of the sun which pass directly between the dynamic or central mass of the sun and the earth's mass as a whole. Thus as the earth is constantly moving in its orbit, it makes a corresponding change of position upon the surface of the sun and thus prevents the neutralization electrically of any portion of the sun for the earth, consequently the electrical state of the earth and sun is kept constantly active, by the earth thus constantly changing over and to a new portion of the sun's mass as it constantly swings in its orbit around the sun; hence the dynamic states of the earth and sun are kept constantly renewed and does not become neutralized by long exposure upon any one portion of any mass in either body, consequently not subject to change as with the surface of the earth surrounding each pole as already explained. Thus the electrical affinity of the sun for the earth and of the earth entire for the sun is at no time annulled and thus becomes a constant force in producing the perpetual movement of the earth around the sun, in accordance with the principles and forces as already herein explained. (See Plate VIII.)

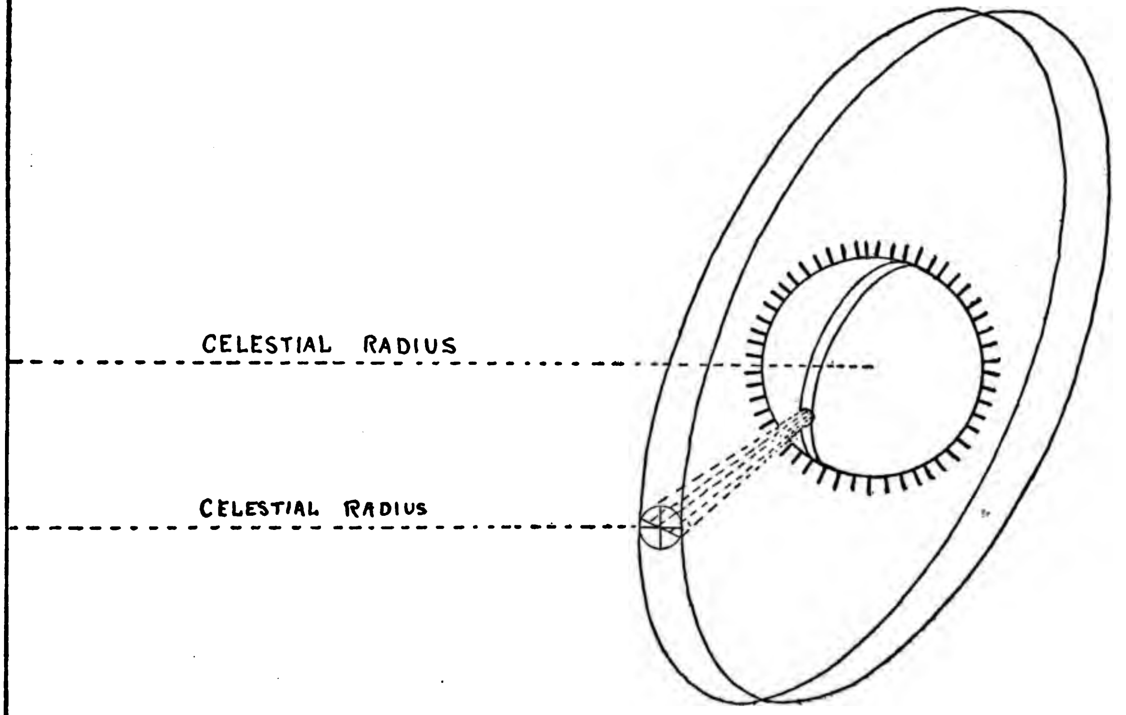

PLATE VIII

CHAPTER V.

THE EFFECTS OF THE UNEQUAL DISTRIBUTION OF LAND AND WATER UPON EACH HEMISPHERE OF THE EARTH'S SURFACE.

The surface of the earth shows but little land south of latitude 30°. Only a few islands and a small portion of Africa, Australia and South America extend south of that latitude; while almost all of Asia and all of Europe, a small portion of Africa and almost all of North America and all of Greenland lie north of 30° north latitude. (See Plate III). Thus we find the greater portion of the land of the earth's surface lies north of 30° north latitude, while almost all of the earth's surface south of south latitude 30° is covered with water. As the land is some 5 and 1-2 or more times as dense as water, we can easily conceive of what a great difference in the weight of each hemisphere this condition must produce. Let us for a moment consider what effect this will have upon the equilibrium of the earth as it encircles the sun, traversing its orbit from year to year. The earth is an individual body floating in space, held from dropping to, or rather from being drawn to the celestial center by the opposing force exerted by the sun's influence upon the earth, compensated at times by the earth's momentum, and having its guiding influence exerted throughout its orbit by the delicate yet ever present gravitating pull from the celestial center, as has been already considered in this work. Thus the earth is suspended as it were in space, held by the electrical influence of the sun from dropping upon or rather from being drawn to the celestial center, the center of the vast universe. The celestial pull upon the earth is constantly exerted over the earth according to its mass, consequently as the heavier portions within any substance tend to sink nearest the attractive power, so does the heavier hemisphere of the earth turn facing nearest to the attractive power exerted upon the earth by the celestial center. Thus the true axis of the earth, which represents the line of the center of the equilibrium of the earth, passes through the poles, the north pole representing the point to which all the earth's mass naturally points or rather gravitates. Thus the magnetic needle always points towards the north pole, or rather along the line representing the center of gravitation, upon which the earth is most nearly balanced. Variations of the needle often occur from disturbances to the electrical balance possibly due to the gravitation of the earth's mass centralizing south of local points taken upon the earth's surface in extreme northern latitudes, such influence being alike exerted upon the magnetic needle.

Thus as a ship is held by its anchor, so is the earth held by the celestial gravitation, made flexible by the change in the electrical balance of the pull and push force exerted between the sun and the earth, causing the earth either to approach nearer or to recede farther from the celestial center, depending upon the variation of the solar influence over the earth, which as already explained produces the motions of the earth, both upon its axis and throughout its annual circuit in traversing its orbit around the sun.

Another effect of the unequal distribution of land and water in each hemisphere is the assistance such an arrangement gives to the movement of the earth in its orbit. Let us consider this effect commencing at the winter solstice. The earth on passing the winter solstice has reached the neutral point in each hemisphere, where the changing electrical forces in each hemisphere reach their electrical balance. The electrical balance being reached first by the northern hemisphere, which is very soon followed by the southern hemisphere near the time of the earth reaching the perhelion point in its orbit.

The northern hemisphere taking the lead in reaching its electrical balance will also take the lead in exerting an electrical pull force for the sun, before the southern hemisphere reaches its electrical balance and begins to exert an electrical repellent force for the sun. The northern hemisphere taking the lead in electrical change by virtue of its great preponderance of land surface over the land surface of the southern hemisphere, while the southern hemisphere is retarded in making its electrical change by virtue of the great preponderance of water surface over the water surface in the northern hemisphere. Thus the solar pull rapidly develops over the northern hemisphere now changing to a negative electrical state, before the solar push has developed over the southern hemisphere assists the earth to retain the circular course of its orbit by overcoming the momentum of the earth and the celestial pull. The southern hemisphere has near this time developed a solar push but in a much weaker degree than the more quickly acting northern hemisphere, thus the earth is pushed to the westward, at first faintly but in slowly increasing degree as the earth passes southward in its orbit. The slowness with which the southern hemisphere develops its electrical change, which is due to its great preponderance of water over the northern hemisphere, gives the northern hemisphere time to develop electrically to the fuller extent and thus cause the solar pull to reach its maximum pulling force and hurl the earth southward against the force of the celestial pull, causing the earth to hurl apast the vernal equinox before the force of its momentum is checked. The moment that the earth passes the vernal equinox, the pushing force of the southern hemisphere becomes a propelling force to hurl the earth farther southward against the celestial pull, while the pulling force of the northern hemisphere becomes a retarding force to check the onward course of the earth and combines with the celestial pull to overcome the propelling force of the southern hemisphere and to draw the earth nearer the sun. But the moment that the earth passes the vernal equinox the area around each pole begins to change, the south pole from constant illumination to constant unillumination, while the north pole changes from constant unillumination to constant illumination, this change with respect to the sun's rays marks the beginning of an electrical change with respect to each hemisphere. But the slowly changing southern hemisphere has now become aroused to its full electrical force and makes its maximum strides in a southern direction and thus with the momentum of the earth overcomes the force of the northern hemisphere and the celestial pull in retarding the onward course of the earth, the resultant being a circular course with a southern trend toward the solstitial plane. Yet the extra force required to overcome both the celestial and the solar pulls for the earth, sufficiently to send the earth as it were outward and upward against the celestial attraction, could not occur were it not for the unequal time required for each hemisphere to make its electrical change, thus the northern hemisphere again by changing more readily or rapidly than the southern hemisphere, tends in a measure to lessen its opposing force to the southern hemisphere and thus by lessening the solar pull of the northern hemisphere more rapidly than the solar push of the southern hemisphere tends to lessen its force, the southern hemisphere is thus able to overcome the celestial pull and continue to send the earth farther southward in its course, while traversing the second quadrant of its orbit, until the slowly changing southern hemisphere has accumulated negative electricity sufficiently to balance its contained positive electricity and thus annul its propelling force and thus check its further progress southward. Let us consider the effect while traversing the third quadrant of the earth's course around the sun.

At the time the earth passes its aphelion June 21st, it is influenced more particularly by the earth's momentum and the celestial pull, the hemispheres now being near their respective electrical balance points. The celestial pull would incline to overcome the momentum and cause the earth to rapidly approach the sun near the solstitial plane, were it not for the rapidly changing northern hemisphere now coming to the rescue and beginning its electrical repellent force for the sun, by virtue of its newly acquired electrically positive state, causing the earth to be repelled from the sun and thus uniting with the earth's momentum to carry the earth to the eastward of the solstitial plane. Thus the repellant force exerted by the northern hemisphere of the earth combined with the momentum causes the earth to whirl to the eastward while the constantly gravitating force exerted by the celestial center causes the earth to progress northward; the combined influence being a resultant drawing the earth in a circular course both to the eastward and to the northward. But the increasing electrical push exerted by the northern hemisphere of the earth for the sun combining with the earth's momentum causes the earth to be pushed far to the eastward in its orbit before the slowly progressing solar pull becomes sufficiently established in the more slowly changing southern hemisphere, which slowness of change gives to the earth's orbit an eastward progression to the extent of the sun's eastward progression annually, over the earth's westward retrogression after passing the equinoctial plane from September 22nd to March 21st, which is alike checked in the northern arc of the earth's orbit by the rapidly changing northern hemisphere, changing its electrically positive force to an electrically negative force and likewise checking the westward retrogression of the earth after its passing the winter solstice or its perihelion on December 22nd. Thus by the earth's momentum being slowly checked by the slowly changing southern hemisphere after the earth passes its summer solstice or aphelion on June 21 and the earth being allowed to pass much farther to the eastward while making the southern arc of its orbit and the earth being early checked by the rapidly changing northern hemisphere serving to check the earth's momentum and causing the earth to progress nearer the sun before the more slowly changing southern hemisphere develops its repellent force for the sun while the earth is retrograding to the westward while traversing the northern arc of its orbit, causes the earth to make a general eastward progression to correspond to the solar progression in the solar orbit annually. The reader will note that the slowly changing southern hemisphere is responsible for the increased distance of the earth from the sun in reaching its aphelion on June 21st and further than the same cause is responsible for the earth progressing farther eastward from the solstitial plane in its orbit from June 21st to September 22nd than the earth retrogrades to the westward of the solstitial plane from December 22nd to March 21st. It will be noted that the rapidly changing northern hemisphere is likewise responsible for the earth approaching nearer the sun while reaching its winter solstice on December 22nd after passing its autumnal equinox on September 22nd also that the rapidly changing northern hemisphere is responsible for the sooner checking the westward retrogression of the earth in its orbit after passing the solstitial plane or winter solstice

December 22nd to its vernal equinox on March 21st. Thus the northern hemisphere wields an influence that both draws the earth nearer the sun and shortens the northern arc of the earth's orbit lessening its westward retrogressive movement, while passing through the northern arc of the earth's orbit; while the southern hemisphere wields an influence that allows the earth to pass farther from the sun on reaching its aphelion increasing the length of the southern arc of the earth's orbit and allows the earth to be whirled farther to the eastward, thus increasing its progressive eastward movement, while passing through the southern arc of the earth's orbit. Such variations being due to the difference in the time required to make the electrical changes in each hemisphere respectively.

It appears to the writer that such a condition must exist with respect to all planets and that such portions of all planets as may be directed toward the celestial center must consequently contain a denser mass than the portions that point in the opposite direction. Such being the case whatever eccentricities may exist in their respective orbits must be produced by the relative differences between the density and consequent radiating powers of their different hemispheres. It will be readily perceived that such being the case that the earth and all other planets that have a general easternly progression, whether of the solar system or of other similar systems, encircling the celestial center, must outline a course that would appear on a diagram as having loops. (See Plate XIII.).

Thus by the earth failing to recede to the westward in passing through the northern portion of its orbit from September 22nd to March 21st as far as it progresses to the eastward while forming the southern portion of its orbit, it can be readily perceived how that such an outline would indicate a course that tends to loop upon itself with each successive loop occupying a position eastward of homologous parts of the preceding circuits. Thus it can be perceived how the earth and all planets progress to the eastward while traversing their respective ororbits around the central mass of their respective systems and thus keep in progressive unison with the general eastward movement around the great celestial center, traversed by each great central mass governing each great solar system respectively.

We will now consider the effect while the earth passes through its fourth quadrant. The moment that the earth passes the equinoctial plane on Sept. 22nd, the poles begin to change electrically and the electrical state of each hemisphere begins to wane from its maximum to the electrical balance that each hemisphere reaches near the time of passing the winter solstice. Thus the northern hemisphere will again change with a greater degree of rapidity than the southern hemisphere, this tendency will cause the pushing force of the northern hemisphere to cease with a greater degree of rapidity than the pulling force of the southern hemisphere; as the celestial pull and the pushing force of the northern hemisphere both tend to assist each other after the earth passes the equinoctial plane, thus by their combined force the earth is carried away from the sun and approaches the celestial center and solstitial plane, while the pulling force of the southern hemisphere tends to draw the earth to the sun. Were each hemisphere equally supplied with land and water surface then each would make equal electrical changes in equal times, the celestial pull remaining constant would continue to exert a pulling force upon the earth while each hemisphere would be equally ceasing and approaching that electrical balance that finally would exist at the same time, the earth would then pass from its present orbit away from the sun, and the sun's influence, and approach the celestial center; but the unequal distribution of the land and water areas over the hemisphere of the earth prevents this condition from arising and while the northern hemisphere is letting go its pushing force for the sun the pulling force of the southern hemisphere retains a sufficient pulling force for the sun to overcome the celestial pull and draw the earth considerably nearer the sun by the time it reaches its winter solstice on Dec. 22nd than it was from the sun at the time it passed its summer solstice on June 21st.

It is evident that at the moment that the electrical balance, between the negative electrical forces gathering in the northern hemisphere and the positive electrical forces receding in the northern hemisphere, was reached that, immediately the waxing negative electrical force would overcome the waning positive electrical force in the northern hemisphere and begin to exert a pulling force upon the earth toward the sun, which would immediately assist the waning negative electrical force still remaining and maintaining supremacy in the southern hemisphere and cause the earth to be pulled sufficiently strong by the sun to overcome the force of the celestial pull, augmented by the momentum of the earth, sufficiently to change the general direction of the earth in its orbit from that of northward to that of westward and then from westward to westward and southward near and soon after the time the earth reaches its winter solstice on December 22nd. Such combination of the forces acting upon the earth causes the earth to approach nearer the sun than at any other point in its orbit, hence causes the earth to reach what is termed its perihelion. But near this point the electrical balance between the waning negative electrical force and the waxing positive electrical force in the southern hemisphere is reached and that moment the southern hemisphere begins to exert a waxing, pushing force against the sun, or rather the sun against it, which now combines with the force exerted by the celestial pull to resist the waxing negative electrical force of the northern hemisphere, which inclines to draw the sun or rather be drawn by the sun, the resultant being sufficient to propel the earth in a direction outlining the first quadrant of its orbit, traversed from Dec. 22nd to March 21st. Thus the earth moves in its orbit due to the unequal rapidity in the electrical changes of each hemisphere, which is due to the unequal distribution of the land and water areas in each hemisphere. Were they equally divided the earth would be neither pulled toward nor pushed from the sun, but each hemisphere electrically balancing the other the earth would take but one movement, that upon its axis, while the celestial pull would draw the earth away from the sun toward the celestial center. Thus the great God and Creator of the Universe, who gave to the planets their origin, position and the distribution of their various component parts, so adjusted the position of our earth relative to the sun and gave to each hemisphere such distribution of the land and water surfaces, that the relation existing between each shall serve to maintain the earth in one position relative to the celestial center and so adjust each that the motion of the earth in its orbit is maintained and becomes perpetual, while in so doing changes are likewise made in climatic conditions giving to the earth various seasons, making it possible for life to receive those various climatic changes necessary to a higher and more perfect development in both plant and animal life. By such changes each kingdom, whether vegetable or animal, has both its periods of fruitage and repose. Thus are added a more proficient and a more perfect existence to every living form, giving to mankind, and to every living creature as well, fruitage in due season and above all, those electrical changes absolutely necessary to the health, development and greatest comfort of mankind. Thus the beneficent effects of the great wisdom displayed in creation and in the various distribution of the elements of cause, that incline to produce the most beneficent results in securing the greatest good and healthful comfort to all of God's creatures, becomes but additional rational evidence of God's presence and supervision in all His handiwork throughout the realm of creation.

CHAPTER VI.

CAUSES PRODUCING THE HEAT OF SUMMER.

(See Plate V.)

Let us now endeavor to consider why the atmospheric heat is greatest during certain seasons of the year. As the electrical states alternate between the two hemispheres of the earth so do the seasons of the year alternate between the two hemispheres, depending upon the heat of the atmosphere generated by the electrial union of the electricities of the earth and sun, and upon the alternation of the reciprocal relation between the earth and the sun. While the earth is passing through its first quadrant from Dec. 22nd to March 21st and the northern hemisphere is gradually changing from winter to springtime, the southern hemisphere is as gradually changing from summer to autumn; so it is while the earth is passing through its third quadrant from June 21st to Sept. 22nd and the northern hemisphere is experiencing its summer, which is gradually, day by day, changing from summer to autumn, the southern hemisphere is undergoing its winter, which day by day is changing from winter to springtime. As the conditions that produce these changes from one season to another are similar in each hemisphere, we will consider the causes that produce such changes in but one hemisphere, it being known that the conditions necessary to produce any given season in one hemisphere are similar and equally applicable to the production of like seasons in the other hemisphere. Let us now consider why the heat is most intense over the northern hemisphere while the earth is passing through its third quadrant from June 21st to Sept. 22nd. We can easily conceive how the area of constant unillumination decreases around the south pole while the area of constant illumination decreases around the north pole as the earth whirls in its orbit from June 21st to September 22nd, in passing from its aphelion or summer solstice to its autumnal equinox, while the ecliptic is receding from 23°27′40″ north latitude to the equator and the line of illumination is receding to the poles. The unilluminated area around the south pole, from March 21st to June 21st, day by day increased, and received a surplus of negative electricity that day by day was driven from the illuminated area around the north pole; rather the negative electricity of the earth was day by day driven through the earth from the northern hemisphere to the unilluminated area around the south pole, where it remained stationary and uneffected by the sun's rays. Thus, as day by day the unilluminated area increased and filled with negative electricity, the negative state of the increasing illuminated area around the north pole was as gradually becoming weaker and being filled with positive electricity flowing from the southern hemisphere, having no affinity for the sun's rays. The point having been reached by June 21st when the areas of constant unillumination and constant illumination as designated around the poles respectively, had reached to 23°27′40″ from each pole, wherein the balance between the negative and the positive electricity within each hemisphere was reached when each neutralized the other. The earth by its momentum was whirled in its orbit apast the solstitial or common plane that would connect the earth, sun and celestial center at the solstices. The unceasing state of the electrical changes within each hemisphere would the moment that a neutral point was reached, change the balance and give the preponderance electrically to the opposite hemisphere, and thus the northern hemisphere would become electrically positive while the southern hemisphere would become electrically negative, the northern hemisphere would thus, but slightly at first with a constant increasing force reject the sun and be rejected by the sun while the southern hemisphere would likewise slowly change electrically and draw the sun and be drawn by the sun, the earth changing in its general direction from traveling inclining from the celestial center to traveling inclining toward the celestial center. The earth as stated gradually lost its attractive force and as gradually acquired a repellent force for the sun in its northern hemisphere, while it as gradually lost its repellent force and accumulated an attractive force for the sun in its southern hemisphere, the repellent force changing to the northern hemisphere. During this change the negative electricity of the earth was being driven from the constantly illuminated area around the north pole to the increasing unilluminated area around the south pole. The readiness with which this negative electricity was received within the ever-increasing unilluminated area surrounding the south pole during this quadrant and the ease of its transmission through the earth from the northern hemisphere, gave rise to a lessened degree of resistance to the electrical flow, consequently a lessened degre of heat from any resistance at the points of electrical union of currents, consequently a lessened degree of electrical energy and a lessened degree of heat from resistance to the accumulation and union of electrical energy, while the south pole continued to increase its unilluminated area. Thus the generation of heat is not intensely active and its surplus being rendered to a certain extent latent and absorbed in changing the existing humidity of the atmosphere from the cold of winter to the latent heat of summer, the heat is not so perceptible while the mildness of spring and early summer is felt in a gradual change from the cold of winter to balmy springtime that almost imperceptibly changes to the milder yet increasing heat of the early summer days. But when conditions changed on June 22nd in which the unilluminated area around the south pole could no longer increase its area and the northward and eastward trend of the earth in its orbit began to decrease this unilluminated area, the electrical flow received a check and a consequent resistance to its further accumulation as the southern hemisphere became electrically more negative and the tension began to increase within its intermolecular spaces. Consequently this increased tension produced an increase of electrical density within the interior of the earth. As the southern hemisphere fills electrically, the increased electrical tension and density is transmitted back along the receiving lines until this density becomes manifested in an increased negative electricity along the surfaces of the earth between the winter line of the southern hemisphere and the area of constant illumination around the north pole. The denseness of the negative or terrestrial electricity along these surfaces of the earth as given tends to further check and increase the resistance to the negative electrical flow. The negative or terrestial electricity will thus begin to form an increased resistance to the electricity of the sun at the earth's surface and in the adjacent atmosphere, wherever such surfaces have an affinity for the sun's electricity. Thus the intermolecular tension along the surface of the earth and within the adjacent atmosphere will intensify, the molecular resistance will become greater, the electrical union will become more confined, the electrical forces more compact, the friction more pronounced and the consequent heat from such intensified state of the electrical union will become increased and more manifest as such conditions are increased and prolonged throughout the summer months. Thus the heat of summer is intensified in the northern hemisphere while the earth is passing through its third quadrant from June 21st to Sept. 22nd; while the heat of summer is intensified in the southern hemisphere while the earth is passing through its first quadrant from Dec. 22nd to March 21st. It will be seen that the conditions suitable for the production of the heat of the summer months in either hemisphere are produced while the earth is passing through the second quadrant after passing the equinox, when the illumination of the poles changed respectively and the electrical states of the poles likewise began to change. It is due to the intensifying of this electrical state during the last quadrant prior to another change that the greatest heat upon the earth's surface is produced. Such is the reasoning if we are to consider the existence of two kinds of electricity, but if we are to consider the existence of but one kind of electricity, the reasoning is identically the same excepting that we are to consider that the southern hemisphere is being constantly depleted of its electricity after the earth passes its vernal equinox, March 21st, until it reaches its autumnal equinox, September 22nd.

In such consideration of the electrical states of the different hemispheres, we are to consider the electrical flow as passing from the unilluminated area surrounding the south pole at this time and flowing toward the sun, yet held by the earth along the direct lines of the sun's rays. Thus when a certain portion of the earth's surface becomes exposed to the sun's rays for a sufficient time to become changed electrically or rather loses its electrical affinity, as in the diurnal rotation of the earth upon its axis as already considered in this work, then by virtue of the diurnal rotation of the earth such electrically satisfied portion becomes rotated to the opposite side of the earth from the sun, where by virtue of the incline of the ecliptic to a perpendicular to the earth's axis at the equator this electrically filled surface is carried in direct line with the sun's rays in reciprocal relation with the earth, such position being the electrical antipode, when the rays of the sun exert a drawing force upon the earth drawing the electricity from the surface and depletes such surface of its contained electricity.

When such electrically depleted surface shall have again rotated under the sun's rays due to the diurnal rotation of the earth, then such surface falls in line with a surface lying upon the opposite side of the earth and south to the extent of double the distance the ecliptic may have traveled from the equator. By virtue of the electrical attraction exerted by the sun's rays this surface again draws from such surface lying south and on the opposite side of the earth along the line of the sun's rays, if prolonged through the earth, depleting the electricity of the earth from the southward and increasing the earth's electricity to the northward. In this manner the earth's electricity may flow from the unilluminated pole and throughout that hemisphere into the hemisphere having its pole illuminated, intensifying the earth's electricity around the illuminated pole and toward the equator in the same hemisphere. Thus our summer heat may increase from such electrical tension and condensation around the illuminated pole and within the northern hemisphere during our summer in the northern hemisphere, the same principle applying to like conditions in the southern hemisphere, producing their summer during our winter.

CHAPTER VII.

CAUSES PRODUCING THE WINTER SEASON.

(See Plates V. and IX.)

We have considered how the heat of summer is produced, and have traced the earth in its orbit through the summer season of the northern hemisphere and have considered the heated state of the northern hemisphere of the earth as it comes whirling past its autumnal equinox and enters the fourth quadrant of its orbit. We have also considered how the north pole, after Sept. 22nd, becomes shaded from the sun's rays, and how the tangent line of the sun's rays gradually traveled from the north pole, leaving a greater unilluminated area each day surrounding the pole until this area increased to 23°27′40″ each direction from the pole. We have considered the electrical effect and how the earth's electricity now accumulates around this pole, producing a negative electrical pole, which remains constant while this area remained unilluminated. The constancy of the negative electrical state of this area causes a like tendency for the surface of the earth, that receives the sun's rays that, if prolonged, will emerge within the unilluminated area surrounding the unilluminated pole, to become and be held electrically positive, or approximately so. Hence such electrically positive area will have but weak or no affinity for the sun's rays, consequently but little heat or at most a minimum electrical effect upon such surface of the earth by the sun's rays. Consequently we have a cooling of the earth's surface, and the phenomena of winter over the northern hemisphere. This condition begins first around the north pole on the first failure of the sun's rays to reach the pole and continues constantly progressing toward the equator until the ecliptic ceases to pass further southward, when the winter line has reached to 19°37′ north latitude. By consulting a diagram it may be seen how in the northern hemisphere the rays of the sun, if extended through the earth, would emerge just as far north of the equator as the ecliptic has traveled south of the equator. Thus the deviation from a line parallel with the equator is just twice the distance that the ecliptic may have traveled from the equator. This principle holds good in either hemisphere regardless of the direction that the ecliptic may be passing either to the north or to the south of the equator. As the heat generated upon any portion of the earth is dependent upon the earth's mass along lines parallel with the ecliptic, it will be seen that after Sept. 22nd in the northern hemisphere the mass along such lines will steadily decrease until Dec. 22nd, when the mass will begin to increase as the earth passes in its orbit southward, bringing the ecliptic again northward. This is an important factor in considering the surface heat of any locality, while the sun and earth are reciprocal in their electrical affinities, and its influence must not be disregarded. (See Plate IX.)

It will be found at the time of the winter solstice that the ecliptic has progressed south of the equator 23°27′40°, while the line of illumination has progressed a like distance from the poles. It will be seen that rays of sunlight that strike the earth at the ecliptic would emerge on the opposite side of the earth, if prolonged through the earth, 23°27′40″ north of the equator or at the tropic of cancer. As the line of illumination extends to the arctic circle at this time it will be seen that by virtue of the diurnal movement of the earth that the line of illumination will traverse the arctic circle during a diurnal revolution, consequently all rays falling north of the ecliptic, if prolonged through the earth, will emerge north of the tropic of cancer. But all rays emerging within the arctic circle will not be subject to diurnal electrical change and consequently will hold the opposite surface, or their electrical antipode in the same electrical state unchanged from positive to negative. But all lines emerging between the arctic circle and the tropic of cancer are not so influenced but become subject to change. The distance between the tropics of cancer and the arctic circle is 43°04′40″, therefore all rays for a like distance falling north of the ecliptic will not be subject to change. But 43°04′40″ north of the ecliptic at the time of the winter solstice reaches to 19°37′ north latitude. Hence all rays falling between 19°37′ north latitude and the arctic circle on Dec. 22nd will fall upon an area having its electrical state held approximately positive to the sun's rays, consequently having practically none or at most but little affinity for the electricity of the sun and consequently but little or no heat will be generated, cold will accumulate and all the phenomena of winter will occur, while on the opposite side of the earth's surface within the unilluminated area around the north pole, the electrical state will remain negative and continue to have an affinity for the sun's rays, but will be prevented from diurnal change by the earth intervening and preventing daily exposure of such surface to the sun's rays. But 43°04′40″ north of the ecliptic will reach to 19°37′ north of the equator at this period, Dec. 22nd, the ecliptic being at this time 23°27′40″ south of the equator, consequently the winter line upon the earth's surface will be felt on Dec. 22nd as far south as 19°37′ north latitude. All the illuminated portion of the earth's surface north of this latitude will be held electrically positive, having passed under the influence of the negative state of the unilluminated area around the north pole, consequently the winter season, will be felt over all the area north of 19°37′ north latitude; yet such area will be influenced by the prevailing winds and water currents which tend to modify any climate, the length of the winter in any latitude being inversely as the distance in latitude of that place may be from the north pole, subject to modification by winds and water courses. By this means one can form some idea of the length of the winter of any place, and at what time that place will fall under the influence of the positive state of the earth's surface and the approximate cessation of the sun's heat upon the earth's surface during that period. Another means of determining the winter line will be to draw a perpendicular to the line of the ecliptic through the earth's center. This perpendicular will emarge from the earth at the line of constant illumination, surrounding the south pole and at the line marking the constant unilluminated area surrounding the north pole, which on Dec. 22nd is 23°27′40″ distant from the poles marking that same distance around each pole for the area effected, consequently an area around the north pole, covering twice 23°27′40″ or a total of 46°55′20″ of a negative and unilluminated area around the north pole. Counting 46°55′20″ each way from the tangent point of the sun's rays, which marks the line of the unilluminated area around the north pole, will take us one way over the unilluminated area through the north pole and to the line of tangency each day to the sun's rays on the opposite side of the pole and just 43°04′40″ from the line of the rays of the ecliptic, if extended through the earth, while counting 46°55′20″ from the line of tangency in the opposite direction will take us to within 43°04′40″ from the line of the ecliptic or 19°37′ north of the equator on that side of the earth receiving the sun's rays on Dec. 22nd. Hence the winter line is found to be 19°37′ north of the equator on Dec. 22nd. This winter line started at the north pole on Sept. 22nd and progressed steadily southward after that date until Dec. 22nd, when it reached within 19°37′ of the equator and consequently passed over 70°23′ of latitude, making for the quarter year of 91 days an average of 46′24″ or 2784 seconds of latitude each day. Now we may deduct 19°37′ from the latitude of the place to be determined and reduce the remainder to seconds and divide by the number of seconds passed over in one day, which will give us the number of days prior to Dec. 22nd that the winter line passes over the place being considered. Another means is to deduct the latitude of the place from 90° and reduce the remainder to seconds, then divide by the number of seconds that the winter line travels over in one day, which will give the number of days after Sept. 22nd required for the winter line to reach the latitude under consideration. In latitude 40° this will give about the 25th of November that the winter line passes over that place and the time we may expect real winter weather to begin. Of course, there may be some winter before that time, or winter may be deferred to a later date, but that will be due to the variations in the prevailing winds, proximity to water and other causes, also to the variations in the electrical states in each hemisphere, the southern hemisphere being mostly covered with water, which has its effect in retarding and in lack of uniformity in electrical changes due to the movements of the waters and the consequent effect upon the electrical changes over the southern hemisphere; consequently its variable effects over the electrical states of the northern hemisphere. Influence of heavenly bodies, also icebergs, storms, great movements of the waters of the earth, as well as the winds of the earth all have their influence in disturbing the uniformity in the electrical changes in either or in both hemispheres of the earth.

On December 22nd when the earth passes into the first quadrant of its orbit, the winter line begins to recede from its southern limit of 19°37′ north latitude and starts northward. As the unilluminated area covers the same distance in latitude as the distance between the winter line and the line of illumination in that hemisphere, and as half the distance in latitude of the unilluminated area lies beyond the pole, therefore the distance from the winter line to the pole will be three times the distance from the line of illumination to the pole. Consequently, as the winter line is apparently being lifted at the rate of 46′24″ per day, the unilluminated area is decreasing at one-third that rate or approximately 15′28″ per day. Thus a ring 15′28″ of latitude is being released each day around the outer limits of the unilluminated area surrounding the north pole. As this unilluminated area is already negative from its long unexposed period from the sun's rays, this ring that is being released each day will consequently have an affinity for the sun's rays and respond to the positive electrical state of the sun's rays, when such area is each day rotated under the sun's rays; this exposure to the sun's rays will have a tendency to change such area to a positive state, yet, as the period of exposure is at first very short, increasing each day as the sun rises each day higher in the horizon approaching the perpendicular which it reaches on March 21st the tendency will thus be at first to impart a very weak positive influence, which is soon replaced by such negative electricity as may be forced from the southern hemisphere and carried to the southern limits of the winter line to be forced into such portions of the northern hemisphere as may find position for the same, as the winter line is being lifted and carried farther north each day; thus the tendency is to immediately replace such positive influence over the newly exposed area that is being left subject to daily illumination by the receding line of illumination with negative electrical force; consequently the negative state surrounding the north pole will incline to remain negative for a distance of 23°27′40″ from the pole, this area being held negative from the electrical pressure from the southern hemisphere, as already pointed out and explained on previous pages of this work. Thus the true winter line will now not be estimated along the line connecting the sun with the line marking the receding unilluminated area surrounding the north pole, measured from the opposite of the earth from the sun's rays through the earth to the point on the illuminated side of the earth making the limits of the area held positive by the negative state of the area between the line of unillumination and the north pole, but will be measured from the arctic circle along the line connecting the opposite side of the arctic circle from the sun, 180° distant from the zenith line, to the sun. It will be seen that the surface of the earth north of this line between this line and the arctic circle will be held positive by the negative state of the arctic circle, while the surface of the earth south of this line will be released from a positive electrical influence, as the ecliptic passes northward to positions where rays parallel with the ecliptic will strike the earth driving the negative electricity of the earth to positions south of the already negatively electrified area within the arctic circle and over areas previously held positive by the negatively electrified area within the arctic circle. Thus the lifting of the winter line and the positive non-reciprocating state of such area with the sun's rays must be estimated differently from estimating the southward travel of the winter line from Sept. 22nd to Dec. 22nd. Thus the northward travel of the winter line will be estimated as follows: If the winter line lies on latitude 19°37′ on Dec. 22nd and the opposite end of the line or the electrical antipode remains apparently stationary at 23°27′40″ from the pole, counting from the opposite side of the earth from the zenith line and 180° distant from the zenith line, while the ecliptic is traveling northward, it is evident that the ecliptic will reach the equator on March 21st and at that time all rays of the sun will fall parallel with the ecliptic and the equator, consequently the ray that falls upon the arctic circle will, if prolonged, emerge at the arctic circle on the opposite side of the earth from the point of entrance; therefore if rays parallel with the ecliptic should enter the earth on December 22nd at latitude 19°37′ and emerge at the arctic circle upon the opposite side of the earth from their points of entrance, while if rays should enter the earth on March 21st at the arctic circle, would if prolonged through the earth emerge 180° distant from the zenith line upon the arctic circle, it is evident that the earth has changed its position during the time in such a manner that the points of entrance of the sun's rays that would, if prolonged through the earth, emerge at the arctic circle, have traveled the distance between 19°37′ and the arctic circle in the time that the earth has passed through its first quadrant from December 22nd to March 21st, which we find to be 43°04′40″ of latitude; therefore as the number of days required for the earth to pass through this its shortest quadrant in its orbit are but 89, we will reduce 43°04′40″ to seconds of latitude and divide the number by 89, to find the number of seconds of latitude that the winter line is lifted each day as the earth passes through this its first quadrant from December 22nd to March 21st. We find 43°04′40″ reduced to seconds of latitude to be 155080, which divided by 89, gives a quotient of 1742 plus, which represents the number of seconds of latitude the winter line is being lifted each day from December 22nd to March 21st. We now find the difference of latitude between the point of observation taken 40° north latitude, and the southern point to which the winter line was carried 19°37′ north latitude to be 20°23′, which reduced to seconds of latitude is found to be 73380 seconds of latitude. This number, 73380 seconds, divided by 1742, the number of seconds that is lifted each day upon the earth's surface from the influence of the earth's non-reciprocation with the sun to an influence of reciprocation, the line making this division of the earth's surface being what the author has termed the winter line, leaves a quotient of 42, with a remainder which, reduced to hours, minutes and seconds of time, gives a total of 42 days, 4 hours, 21 miutes and 13 seconds plus. Thus we find that over latitude 40° north latitude the winter line will be 42 days plus from December 22nd to the time it reaches 40° north latitude. Thus the earth over north latitude 40° will be subject to non-reciprocation with the sun's rays from November 25th, when the winter line passed over this latitude, southward to the date of its return, which is found to be about February 2nd. Thus on about February 2nd the earth and sun will again become reciprocal and heat will begin to be generated over the surface of the earth as far north as north latitude 40°. Thus the first influence of spring will begin on December 22nd at north latitude 19°37′ and gradually extend northward each moment of time, reaching 40° north latitude on February 2nd.

If one wishes to determine the advent of the reciprocal relation of the earth and sun bringing with it the first heat from the sun's rays that is in due time to usher in the season of springtime, they must first subtract from the latitude they wish to determine 19°37′ and reduce the remainder to seconds and divide the number found by 1742, which will give the number of days required after December 22nd to the time of the passing northward of the winter line over such latitude as may be taken in question. Positions in the southern hemisphere are determined from like points in the southern hemisphere. The date taken must be June 21st instead of Dec. 22nd.

Thus winter in the northern hemisphere will begin at the poles on September 22nd and travel southward, reaching latitude 40° about November 25th. Winter will continue to increase in intensity over north latitude 40° until about February 2nd, when it will begin to subside and will after that date gradually give way to the influence of the reciprocal relation between the earth and the sun, that has become reestablished upon the northern hemisphere over areas and under conditions as already explained, which prepares the earth for the approach of spring and the reawakening of living forms, as will be explained in due time in this work. Without reflecting, some may wonder why spring is not immediately established after the earth and sun begin to each respond to the other as manifested by the union of their respective electrical forces. It must be remembered that the earth since Novembr 25th, over north latitude 40°, has been practically deprived of the influence of the sun's rays uniting with the electricity of the earth to form heat upon the surface of the earth and in the adjoining atmosphere; that such conditions have made it possible for the earth's heat to evaporate and, in the absence of this heat, cold has day by day accumulated, making the winter gradually more intense until such relations between the earth and the sun cease and each reassume a reciprocal state to the other, making the production of heat possible by such electrical union, as has been already stated in this work. Thus when the winter line reaches 40° north latitude, the point taken as our illustration, and the earth and sun reassume a reciprocal state, the winter line leaves winter established and having now reached its maximum intensity. The heat generated by the union of the electricities between the earth and the sun is gradually overcome in reestablishing the latent heat lost in the contained vapors of the atmosphere during the establishment of the winter season, in melting the snows, ice, the frozen earth and in warming the cold atmosphere with its contained vapors. Thus it is that the heat is utilized until winter conditions are finally overcome and the earth and atmosphere have become sufficiently warmed to become perceptibly felt by the warming of the contained protoplasm in all living forms. Thus winter gradually gives way to the approach of spring, which is not at once re-established, no more than a full head of steam is at once generated by placing fire under frozen boilers, time for the accumulation of heat being required in each case; therefore the approach of spring with its warming influence is gradually ushered in, while the rigors of winter as gradually subside and finally disappear. The winter line thus steadily travels northward after December 22nd until it reaches the arctic circle on March 21st, while relatively the mass of earth effected is steadily increasing, generating more heat. The negative electrical state of the area within the arctic circle has not diminished, but has, rather become more concentrated and intensified, with negative electrical influence diffused from the arctic circle to the equator, as the earth passes through the first quadrant of its orbit, from December 22nd to March 21st. On March 21st, as the earth whirls in its orbit apast the vernal equinox, the northern hemisphere has reached its maximum negative electrical state, while the southern hemisphere has likewise reached its maximum positive electrical state. This condition tends to send the earth with full force apast the vernal equinox into the second quadrant of its orbit, whirling through space in a southernly course and away from the celestial center, governed by the resultant force formed by the combination of forces as already enumerated in this work. As the amount of heat generated upon any portion of the earth's surface during reciprocal states of the earth and the sun is largely influenced by the amount of the earth's mass lying between the striking points of the sun's rays and their electrical antipodes, it will be seen that the nearer we approach the poles the less heat will be generated as the earth's mass decreases along lines parallel with the ecliptic, until, if it were possible to reach the poles, we would find a condition in which there would be no mass of earth beneath us, both during the periods of the equinoxes and during all that period after the ecliptic passes south of the equator on September 22nd until its return to the equator on March 21st. This condition would be conducive to no generation of heat between the earth and the sun, consequently a condition of absolute cold would exist and does exist at the poles during such periods. But after March 21st the ecliptic passes north of the equator, when the mass of earth influenced at the pole will gradually increase and the heat generated at such point will as gradually increase, reaching its maximum on June 21st, when the mass will gradually decrease and the heat generated at such point will as gradually decrease until September 22nd, when a condition of no generation of heat will occur save by what small amount shall be generated by the union of the earth's electricity for a few days with the sun's rays that reach near a point of tangency at such pole, giving rise to the phenomenon of the Aurora Borealis. After such condition ceases, then a condition of absolute cold will occur and remain until the return of the sun's rays on the following March 21st.

Thus ends our enumeration of the causes producing the winter season under the consideration of two distinct kinds of electricity.

In considering the causes producing the winter season when we recognize but one kind of electricity and that electricity as to all electrified bodies differs only in the degree of electricity contained, we are led to the conclusion that the winter season is produced by the diminution of the earth's electricity by being drawn to the illuminated pole and into that hemisphere of the earth having its polar axis illuminated by the sun's rays. Under such a state electricity would concentrate in that hemisphere to which the ecliptic has passed and become diminished in the opposite hemisphere of the earth. There would be but little condensation of electricity at the points of electrical union, the tension and electrical pressure would be correspondingly decreased and heat generation decreased in the same degree, hence influences conducive to the winter season in the hemisphere of the earth from which the ecliptic may have passed, while in the opposite hemisphere there would exist a condition in which electricity would accumulate and electrical tension correspondingly increase, giving rise to greater friction at the points of electrical union, with heat correspondingly increased, hence the summer season in that hemisphere while the winter season will prevail in the opposite hemisphere where the electricity of the earth has become diminished. The earth will be likewise influenced and the same changes will occur, producing the different seasons of the year, whether we consider but one or two kinds of electricity existing in both the earth and sun.

CHAPTER VIII.

THE INFLUENCE OF DISTANCE FROM THE EQUATOR UPON THE RESIDUAL SOLAR ELECTRO-VITAL FORCE EXISTING WITHIN THE ATMOSPHERE OF VARIOUS LATITUDES; ALSO HOW THE HEAT OVER ANY LATITUDE IS INFLUENCED BY THE INCLINATION OF THE SUN'S RAYS.

(See Plate IX.)

When bodies are drawn by mutual attraction as between the earth as a body and the sun as a body, the attractive force acts in straight lines connecting their masses. The attractive force in each is directly proportional to the mass in each. It is evident that a ray of light falling upon the equator, say at the time of either equinox, will counteract the influence of a greater mass than a ray that strikes the earth—at, say 45°, either north or south of the equator at this time. When we consider the relative masses thus effected we find the relation to be about as 5 to 7; that is, the mass of earth influenced by the sun's rays striking at 45° at the time of the equinox is about 5-7 as great as a similar mass influenced by the sun's rays at the same time at the equator.

Thus the attractive relation between the rays from the earth for the sun and the sun's rays for the earth, varies from the equator toward the poles. The sunbeam that strikes the earth at the equator will have its valency more nearly satisfied and in proportion to the mass influenced according to the above law than sunbeams more distant from the equator; hence the atmosphere at the equator will receive more heat from the ready union of the electricity between the earth and sun than the atmosphere more distant from the equator. Consequently the electro-vital energy from the sun will be more nearly consumed at the equator than in either direction from the equator, and the heated state of the earth's surface and the heated state of the atmosphere will be but products of the union of these two electrical currents at the earth's surface and in the adjacent atmosphere. The loss in electro-vital energy and the increased lassitude from the failure of the atmosphere to invigorate vital forms are in proportion to the relative neutralization of the energy between the electrical forces of the earth and the sun. Therefore when the sun is in the zenith or during sweltering humidity, when clouds envelop the earth, retaining the earth's electricity and insulating the sun's rays from the earth, so that the energy previously imparted by the sun and already existing in the atmosphere is much reduced or almost annulled, are conditions in which heat is felt most and the low vital state of the atmosphere becomes the most oppressive and enervating. Thus it is that the atmosphere is invigorating or oppressive to animal life, depending upon the relative amount of the energy imparted by the sun and left latent as residual vital energy within the atmosphere after its non-requirement in overcoming and satisfying the electrical affinity existing within the electricity of the earth for the electricity of the sun as contained in the sun's rays. Hence as we pass in either direction from the equator toward the poles at the time of the equinoxes, we find the atmosphere containing a greater degree of the vital energy from the sun than in latitudes nearer the equator, the increase being approximately inversely as a section of the earth through any latitude bears to an equally wide section of the earth at the equator. To make it more clear, it is apparent that the vital energy contained within a sunbeam at the equator is more nearly neutralized, that is, its valency is more nearly satisfied by the earth's electricity than any sunbeam with its contained vital energy at any latitude more remote from the equator. The sunbeam that strikes the earth nearer the poles will have relatively less of its energy rendered latent or neutralized, as the earth at that point will bear a reltively less relation in mass to an equally wide segment of the earth nearer the equator. Hence it is that during reciprocal electrical states between the earth and sun, there is a latent vital residual energy imparted by the sun to the atmosphere that remains within the atmosphere, that increases directly with the decrease in the earth's mass from the equator to the poles. But we took the earth as being at the equinoxes, which was only for the sake of clearness in illustration. It is evident that this condition will follow the ecliptic on either side of the equator and that the relative surplus energy from the sun's rays will increase on either side of the ecliptic toward the poles and be subjected to the same laws governing the earth's condition, as at the equator; it being understood that the union of the earth's, and the sun's electricity will vary according to the electrical state of the surface of the earth at various periods of the year, and will increase or decrease with the relative negative or positive state of the particular hemisphere or place upon the earth's surface. All such conditions must be considered in determining the relation of the earth's and the sun's electricity at any period of the year.

Let us consider the conditions presented by the inclination of the sun's rays relative to the surface of the earth at different periods of the year. (See Plate IX.) It will be remembered that while the ecliptic passes from the equator, that if the sun's rays were extended through the earth, they would emerge on the opposite side of the earth, just as far

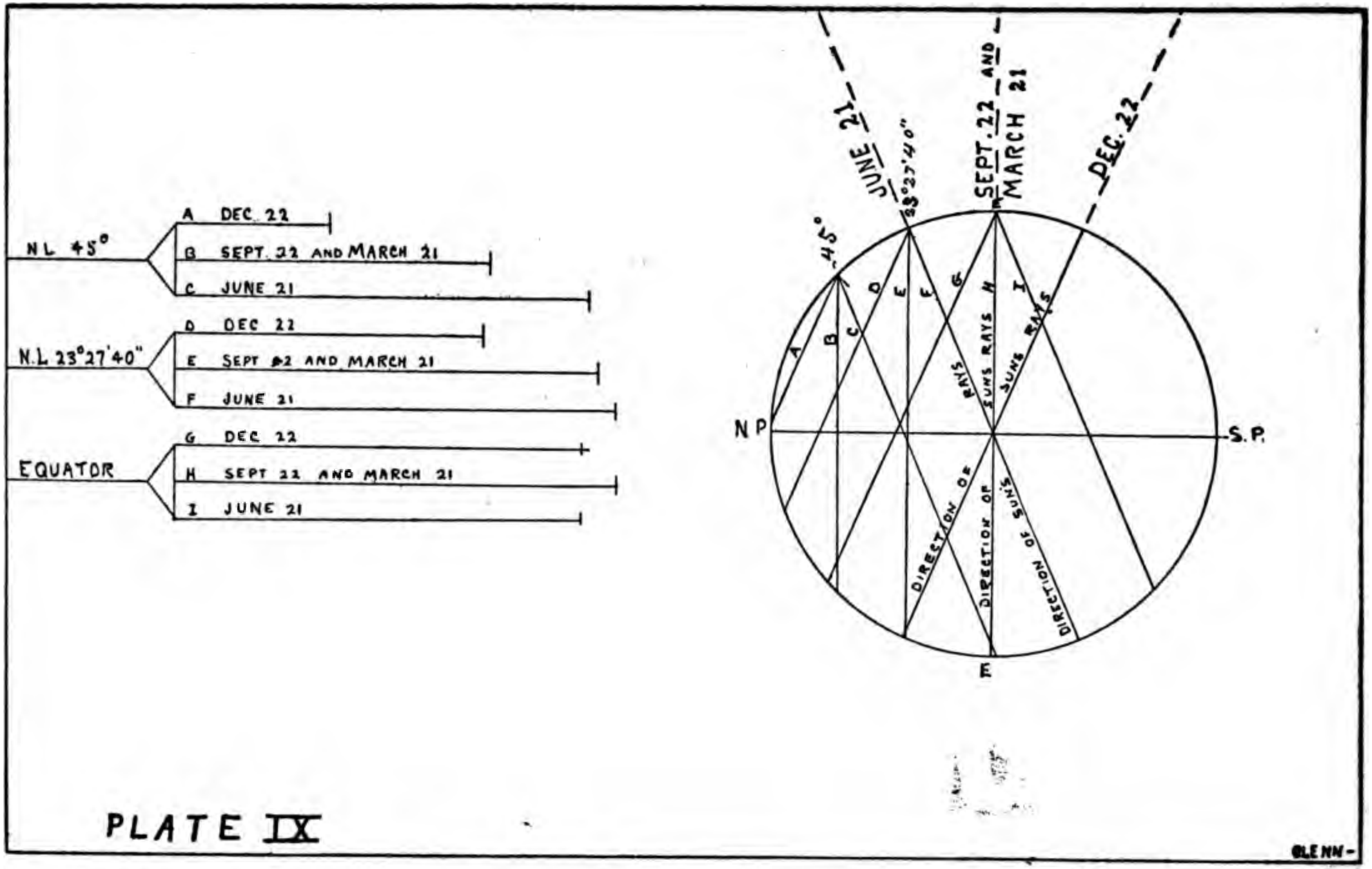
NL 45°
A DEC. 22
B SEPT. 22 AND MARCH 21
C JUNE 21
N.L. 23°27'40"
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PLATE IX

from the equator in the opposite hemisphere as the ecliptic has traveled from the equator. As the ecliptic each day during the diurnal revolution of the earth upon its axis marks a line upon the earth parallel with the equator, so will the line of divergence mark a like parallel line an equal distance from the equator in the opposite hemisphere. Consequently the line of entrance and the line of emergence of the sun's rays will be double the distance from any latitude that the ecliptic has traveled from the equator. While this is true with the ecliptic, it is likewise true of any ray or sunbeam that falls upon the earth. Its line of emergence will be twice as far distant from the latitude of its entrance and measured in the direction of the travel of the sun's rays at the ecliptic, that the ecliptic is distant from the equator; that is, if the ecliptic inclines from the south to the north, as when it strikes south of the equator the point must be taken north, but if the ecliptic inclines from north to south, as when the ecliptic strikes north of the equator, the point must be taken south of the latitude of entrance of the sun's rays being considered. The line of emergence must always be taken toward the unilluminated pole. Thus in latitude 40° north, when the ecliptic is upon latitude 10° south, the line of emergence from 40° will be 60° north latitude; but if the line of the ecliptic is in, say 10° north latitude, the line of emergence of rays striking 40° north latitude will be 20° north latitude, measuring in each case twice the number of degrees that the ecliptic may be from the equator and approach toward the unilluminated pole from the latitude or point of entrance of the rays under consideration.

Thus in the winter season of the northern hemisphere while the ecliptic is south of the equator, the line of entrance of the sun's rays, if extended through the earth, will be inclined northward and toward the hemisphere containing the unilluminated north pole; while during summer in the northern hemisphere, while the ecliptic falls north of the equator, the inclination of the sun's rays are toward the south and the point of emergence will consequently be south of any latitude that may be considered in either hemisphere. The same principle applies to the direction of the sun's rays in the southern hemisphere in either summer or winter or during any season of that hemisphere.

Thus it can be plainly perceived how, that after Sept. 22nd when the ecliptic has passed south of the equator that the sun's rays falling north of the equator will constantly as the ecliptic passes southward, day by day effect a less segment of the earth. Thus in latitude say 45° north, on Sept. 22nd the sun's rays fall parallel to the equator and a segment of the earth parallel to the equator will be likewise effected. There will be about 5-7 the heat generated on Sept. 22nd at the earth's surface in north latitude 45° as will be generated at the equator: but on subsequent dates, while the ecliptic passes south, rays that fall upon latitude 45° north of the equator will effect day by day a less segment of the earth as the line of emergence constantly approaches the north pole until on Dec. 22nd, when the ecliptic has passed 23°27′40″ south of the equator, when the electrical antipode of the sun's rays striking at 45° north latitude, will find exit 46°55′20″ north of such point, which will take to 1°55′20″ beyond the pole, causing such emergence to occur at 88°04′40″ on the solar side of the earth's axis.

Thus from September 22nd to December 22nd, while the earth is passing in its orbit to the northward of its equinoxial plane, the tendency is for the sun's rays to influence each moment a constantly growing less and less segment of the earth's mass. Thus the tendency is to generate less and less heat even before the electrical state of each hemisphere is fully changed to little or no affinity for the sun's rays. The tendency therefore before Dec. 22nd is to increase conditions upon the earth conducive to less heat upon the earth's surface in the northern hemisphere north of the winter line of 19°37′ north latitude, consequently conducive to a full establishment of the winter season that follows before that tendency to less heat is overcome by opposite conditions that follow, and are gradually established after Dec. 22nd. But the winter solstice of Dec. 22nd changes the progression southward of the ecliptic and consequently the line of emergence of the sun's rays cease to progress northward, consequently after that date the segments effected by the sun's rays falling north of the equator will retrograde from the direction of the north pole toward the equator, and thus day by day increase in mass until the ecliptic reaches the equator on March 21st; consequently the tendency is to the formation of more heat day by day in proportion as the mass of the earth so effected day by day increases under the sun's rays. But as the earth is essentially electrically positive between the winter line and the arctic circle, giving rise to the winter season of the northern hemisphere and as the latent heat of the earth soon evaporates, the earth over the area influenced by winter is left cold with an absence of heat that requires time to replace, consequently the earth over such area cannot accumulate much heat in the interval between the lifting of the winter line and March 21st.

It is evident that through any latitude north of the equator that the sun's rays will continue to day by day effect a progressively greater mass from Dec. 22nd to June 21st, while the ecliptic is passing northward upon the earth's surface and the earth is traveling southward from the point of its perihelion in its orbit to the point of its aphelion in its orbit; consequently north of latitude 19°37′ more heat will be produced day by day after the lifting of the winter line by the electrical state of the exposed surface of the earth being changed from positive to negative.

Thus the effects from the sun's rays upon the surface of the earth tend to either increase or decrease as they day by day influence a greater or a less portion of the earth's mass. Consequently after the electrical state of any portion of the earth becomes reciprocal with the sun's rays the heat produced will be essentially proportional to the mass of the earth so effected by the sun's rays. By consulting a diagram of the earth one can easily perceive how the influence of the sun's rays falling upon, say north latitude 45°, will constantly increase as the distance through the earth increases along the line connecting that portion of the earth to the line of possible emergence of the sun's rays if prolonged through the earth from their point of entrance 45° north latitude to their point of possible emergence at any time during the period from Dec. 22nd to June 21st. (See Plate IX.)

Thus the point of possible emergence of the sun's rays that strike the earth along north latitude 45° will vary from 1°55′20″ this side the north pole on Dec. 22nd to 1°55′20″ beyond the equator on June 21st. The earth's mass having constantly increased during that interval of time that the ecliptic was traveling northward and the earth passing southward from its perihelion to its aphelion from Dec. 22nd to June 21st.

Thus it is that latitudes distant from the equator may receive, during spring and summer months while the electrical states between the sun and earth have great affinity from being mutually reciprocal, a degree of heat equal to the increase in mass of the earth's mass so influenced while this heat producing condition is greatly augmented by the increased period of sunshine each day and the decreased period of darkness each night, which as one approaches the poles becomes relatively greater, as the distance around the earth decreases toward the poles. Thus the increase in the relative heat of the earth augmented by the length of times of exposure to the sun's rays gives to northern climates a degree of heat almost equal to tropical climes, while the relative strength of the earth's atmosphere due to its prolonged exposure to the sun's rays during the spring and summer seasons gives to vegetation and animals as well a relatively stronger vital energy that quickens the growth of vegetation and increases the vigor and physical strength to animal life.

The same conditions reversed during the autumn and winter seasons gives to the same latitudes of the earth a relatively longer and colder winter; while the unreciprocal electrical state between the earth and sun during the winter season and the decline in the mass of the earth influenced by the sun's rays prevents that decline in the solar electro-vital energy of the atmosphere over such latitudes as would obtain otherwise during long nights of absence from the sun's rays. Thus the perfection in God's handiwork making the incline of the ecliptic while the earth swings in its orbit around the sun serve to give that degree of heat and length of sunshine necessary to rapid growths of crops during the spring and summer seasons over latitudes distant from the equator, while the unreciprocal relation between the earth and sun during the winter season prevents that decline during long nights in solar vital energy that would possibly become disastrous to life were the atmosphere depleted by a contstant neutralization of a diminished solar energy.

CHAPTER IX.

THE EFFECT OF A LOW DEGREE OF ELECTRO-VITAL ENERGY IN THE ATMOSPHERE UPON THE VITAL STATE OF INDIVIDUALS AND THEIR CONSEQUENT LOSS IN VITAL POWER TO RESIST DISEASE.

The greater depth of the earth's mass and the relative diminution of the length of sunshine each day in tropical climes incline to produce such a high degree of neutralized electro-vital energy with a relatively short period of sunshine in which to enrich and vitalize the atmosphere with electro-vital energy from the sun's rays, that the atmosphere becomes filled to a high degree with neutral electrical combinations, consequently depleted of its solar vital energy to that extent that the air breathed becomes of insufficient strength in vital energizing power to produce that degree of strength in the vital current of the individual to properly functionize the secretory forces of the body, hence failure in bodily metabolism and a consequent loss in vital resistance and a consequent weakening in the eliminating powers of the body, hence the encroachment of disease so prevalent in tropical climes. Especially is such a condition intensified by approaching the equator. As the inclination of the ecliptic during the summer season is such as to give latitudes near the temperate zone and in fact those portions of the temperate zones contiguous to the torrid zones a degree of heat approaching that of the equatorial region and a thickness of the earth's mass equal to the equatorial diameter it becomes evident that the electrical union will become as strong during certain seasons as that near the equator, which will fill the atmosphere with a consequent devitalizing heat and a high degree of electrical combinations that result from the neutralization of the solar vital energy by union with the terrestrial electrical emanations, all of which serve to reduce the vital energizing power of the solar energy until the residual solar electro-vital energy is reduced to a low degree, hence a weak vital force imparted to individuals breathing such atmosphere.

It has appeared to the writer that if individuals in such latitudes where such conditions prevail would seek the highest elevations for their residence and sleeping apartments and where high elevations cannot be obtained to if possible draw from the higher strata of the atmosphere through tubes elevated by means of balloons and suction made by mechanical means to draw air from higher levels to the sleeping apartments of individuals, that by so doing the vital states of the individuals might be raised by thus breathing the atmosphere brought from high elevations where its vital energizing power would be of a higher degree and not so depleted with the neutralizing effects of the earth's electrical emanations. Whether such a theory may be practical or not may be questioned, yet if it were placed in practical application the vital resistance of individuals breathing such atmosphere brought from high elevations would be raised to that point where the ravages of disease would be greatly lessened and possibly in many cases altogether avoided. A test of the vital efficiency of the atmosphere from high levels would possibly encourage the bringing of air from such regions through tubes elevated into the atmosphere by means of balloons or otherwise to supply hospital wards where tropical fevers may prevail, should some philantrophic person with both the means and the disposition, be found who might be disposed to make a persistent and practical test of such means of supplying the sick of tropical climes with a purer and more highly vitalized atmosphere from the higher strata of the air over such disease producing climes.

The writer is of the opinion that only a fair test would be required to prove the great efficiency of the high state of vital energy existing in higher altitudes over regious of the earth having the elctro-vital energy from the sun so depleted that within the surface atmosphere there remains but a low degree of residual solar electro-vital energy, which after a time results in a low vital state of all nerve ganglia and all bodily tissues within animals breathing such vitally depleted atmosphere.

Thus with the eliminating powers greatly reduced through vital weakness and with the eliminating channels clogged with effete matter, the patient is in a fair way to add disease to existing weakness until death claims its victim. The writer will not say all eliminating channels, as the bowels are usually purged to exhaustion, if not by nature's effort to eliminate, through drastic medicines freely applied as is usually the procedure with the medical profession. But the disease producing elements are minutely distributed throughout the bodily tissues, where, both through auto-intoxication of the already weakened cells and through tissue ferments produced by the presence of such germs as nature may have provided to assist the powers of elimination in the work of ridding the bodily tissues, through resolution of the already dead and dying tissues and other waste matter, they become productive of disease in many forms.

Such obstructed state of the tissues deprives the natural flow of blood to such vital cells and tissues and in so doing the essential elements within the blood required by every cell and tissue in maintaining its natural function and absolutely necessary to the life of every cell and tissue are either wholly or partiallly checked and thus prevented from reaching their natural destination in distributing the vital requisites necessary to all vital action. Hence it is that the cells and tissues of the body are deprived of those requisites necessary to their proper functionization resulting in vital weakness, loss of function, and if sufficiently prolonged death of the part or parts so affected or even the death of the individual. The human being so affected is in need of vital cleansing and vital recuperation. To secure the poisonous waste matter from the alimentary canal only is not enough. Nor should we shock the vital powers with corrosive medicines supplied to the assimilating organs and thus further weaken the vital supply to the already waning blood producing and blood cleansing organs; but rather to go to the seat of the trouble surrounding the very cells and tissues of the body and there assist the crippled and waning vital forces to accomplish their natural functions in cleansing the tissues and in supplying the vital requisites to the waning vital cells within the essential organs and tissues throughout the body. In such states of the human body relief is not intelligently given by crippling the forces of nature through filling the patient with strong cathartics and fever depresents, that in their very nature weaken the already weakened vital state of the patient, depressing the heart action and every vital action throughout the body; but relief is intelligently given by subduing fever by the use of cold water immersions, cold moist applications and ice packs, that in the very nature of such applications serve to add tone and preserve the vitality of the already weakened and dying cells; or if the vital heat of the body becomes reduced below normal assist to raise the vital heat by adding moist warm or even moderately hot applications and further the seat of the trouble is reached when the practitioner lays aside all feelings of self importance and begins to meet the essential requirements to vital action. In this he must, as nearly as possible, supply his patient with plenty of fresh, wholesome solar vitalized air to breathe. He must not stop here but remember that the seat of the trouble lies in the obstructed vital state of the bodily tissues of the patient and that without mechanical assistance the vital state of the patient must continue to wane until death either comes to the patient's relief, or if the vital forces should hold out sufficiently long to enable the patient to become sufficiently reduced in flesh to enable nature in this way to rid herself of the obstructed state within and surrounding the bodily tissues and all vital cells and neurones of the body, then the patient may through the efforts of nature find relief of her obstructed vital state. But poor Mother Nature being thus compelled to smother her vital cells, as her various nerve centers and the essential cells composing her epithelial tissues necessary to the secretory action of any organ or viscus, is often unable to give the necessary release to the vital obstruction within such parts before the death of the essential cells take place for want of those vital essentials to every living cell, hence various forms of paralysis and various losses in secretory and other functions of the body often result from such long delay. It is thus by such neglect, through ignorance, prejudice and otherwise on the part of the attending physician that such disastrous results take place commonly supposed to be the result of some disease, when, if the physician had but used just ordinary common sense, and looked after preserving the vital state of such tissues and all vital cells, such results could have been avoided, if he had only considered and reasoned. (I must be excused for insisting upon reason being used as it appears some practitioners never reason, or at least such appears to be the case, judging from their procedure in handling many cases. Possibly they reason from false premises, or are woefully ignorant of the vital requirements of every vital tissue upon which health depends, within their patient.) If he had considered that such tissues must, as it were, smother in an atmosphere of effete matter, while the vital elements within the blood gleaned from the pure air breathed and the taking of proper food assimilated within the blood will not be able to reach such tissues as may through their obstructed state prevent the egress of waste matter and the proper ingress of vitalized blood to nourish and provide such devitalized tissues with their contained cells with sufficient vitalizing power to enable the body to both cleanse the tissues and rebuild their lost and reduced vital state to a point of vital sufficiency to enable the patient to enjoy health without such assistance; hence the practitioner should be able to give such manipulation in such an intelligent manner as to assist the elimination of the disease producing tissue products through the proper eliminating channels distributed throughout the bodily tissues and further to assist the ingress of blood ladened as far as possible with those vital elements necessary to the nutrition, recuperation and replenishment of all vital cells and tissues throughout the body, with those elements neceessary to vital action and the refunctionization of all the tissues throughout the body. In such manner relief is intelligently given to the sick and the practitioner becomes a means to assist the patient to a state of health rather than to hurry the unfortunate creature either to a paralytic state of portions of the body or to the grave through the drastic measures taken in depleting the already reduced vitality of the patient through means of strong drugs that shock the life element and further reduce the vitality of the patient.

How often the sick room is kept so tightly closed that the air becomes so stale from repeated breathing that the sufferer is further weakened and his vitality made to wane throughout every tissue for want of that electro-vital element so necessary to the vitality of the patient and always present in all wholesome vitalized air. How indifferent some practitioners become to such vital demands of the patient! How ignorant many people are of the vitality contained in the very atmosphere that surrounds them in outdoor life and how often they endeavor to shut out such life sustaining elements and stifle the sick room and the patient with an effete, dirty foul air that has become absolutely corrupt from being repeatedly breathed.! How often the doctor is either so ignorant or too indifferent to the vital demands of his patient as to permit such a foul state to exist in the air breathed by his patient! May God hasten the day in which mankind shall awaken to the enormity of the death and destruction of human beings, and especially poor, weak innocent babes, for want of a pure, electro-vitalized air in the sick room, or in any air breathed by any animal form, for that matter.

Has the reader not noticed how sleepy and listless people will become in a crowded church or assembly room when compelled to breathe over and over old stale air that has been repeatedly breathed and warmed over for week after week, receiving its only renewal and vital replenishment through some despised crevice or crack and the occasional opening and closing of the door to the assembly room?

Who has not noticed how easily chilled one becomes, who has breathed such impure air for a time, proving that the air recently breathed was insufficiently supplied with that vital heat producing element to supply the requisite heat to the body, when such blood so poorly laden with that associated energy of oxygen, that electro-vital energy so necessary to the production of heat upon the earth and to the production of vital heat within the body from the air breathed and distributed to the cells and tissues of the body through the oxygen carrying power within the hemoglobin of the blood? Hence it is in all climates where the atmosphere is thus subjected to vital depletion, the vitality of the individual breathing such devitalized atmosphere must steadily wane unless relieved in some manner through change of climate or through natural atmospheric changes.

If all yellow fever patients and those suffering with other diseases where the vital powers have become depleted and the excretions have become torpid from sluggish lymphatics, thus burdening the tissues with toxic products, smothering, as it were, the vital cells and neurones of the body, could be subjected to systematic, intelligent bodily manipulations, such as will tend to promote the elimination from all tissues of such toxic products and induce a thorough circulation of the blood to the remotest tissues, thus assisting all vital processes within the body, and if such patients were privileged to breathe copiously of pure air highly ladened with vital energy as supplied by the sun's rays and not neutralized to too high a degree by the emanations from the earth's electricity, and supplied with an abundance of pure water, suitable food and cleanliness maintained, then we would see the high mortality from yellow fever, and all other fevers and diseases, for that matter, drop to such an extent that it would surprise the world and cause people to ask themselves the question: "Why have not people, and especially the medical profession, thought of this before?" Behold! Like "The owlet atheism flying athwart the noon day sun, crying 'Where is it?' " when behold! they are basking in the eternal sunlight from heaven, laden with the vital force that they have so much desired, and yet they have been and are too stupid to observe and comprehend the value of its presence, to appreciate its importance and to utilize more fully its life-awakening and life-sustaining-powers.

The germicidal properties of this electro-vital force, or of oxygen so vitalized, upon disease-producing germs are most potent and deserve more general recognition. The vital property of oxygen, or rather its associated electro-vital energy, is not only necessary to the vitalization of all living cells and tissues throughout the body, but on the other hand becomes a most potent factor in removing, through its vitalizing powers, conditions conducive to the propagation of supposed disease-producing germs. Supposed disease-producing germs thrive where there exists a low vital state of the bodily tissues. Oxygen, or its associated electro-vital energy, is conducive to a high vital state of the bodily tissues and a consequent strong vital current conducive to strong eliminating power and a more perfect functionization of the various bodily viscera, which are so necessary to health in the individual being.

The solar electro-vital element on entering the blood becomes stored within the hemoglobin of the blood, where it is carried to the tissues and tissue cells throughout the body. After imparting such portion of this electro-vital energy to the cells and tissues as may be required by the cells and tissues the remainder becomes stored within the nerve cells constituting the ganglia of the cerebro-spinal nervous system where it serves to replenish the general dynamic nerve force of the cerebro-spinal nervous system; the food eaten and assimilated possibly contains another electrical element received from the earthly electrical force and stored in food to be eaten and assimilated and distributed to the vital cells and tissues by means of the blood stream, where such portion as may not be thus utilized is possibly stored within the cells constituting ganglia of the sympathetic nervous system. In this manner both the earthy and the solar electrical force become stored within the nervous systems of the body to replenish and maintain the vital current of the body as occasion may demand.

The energizing vital force being received within the cells where both nervous systems meet and produce by their union the vital current cell action, vital heat and the burning of waste and toxic products. In this contact, disease germs are destroyed and vital processes are renewed. The white corpuscles of the blood or the leucocytes of the lymph stream patrol the blood and lymph streams where they serve to act as scavengers in the destruction of such germs as may not become destroyed by contact in the living cells where the vital current is more active. Yet the leucocytes must be carried to the lymph glands, where they are either renovated and made suitable to reenter the blood stream and again patrol the blood as the white corpuscles or resolved through the action of the lymph glands, such action taking place through the union of the vital current within the glands, where such products not capable of being further utilized are by glandular action either rendered suitable for escape through the various excretory channels of the body, or if dangerous to be at that time thrown into the blood stream to be held stored within the gland structures to remain for a more suitable time of exit, or possibly to be held indefinitely.

The union of the vital current within the body greatly inhibits the reproduction of disease germs within the body, and raises the vital cells from a low vital state conducive to disease. As the life of such germs is short, it can be easily comprehended how disease germs will die and become extinct for want of propagation, where the vital current is sufficiently strong to make the tissues sufficiently vital to destroy the fertility of the tissues for the incubation of disease germ spores. Thus it is where the circulation has become stagnated and the lymph channels have become clogged and the tissues have become diffused with the products from cell and tissue action and various vital processes that the tissues are rendered most suitable for the propagation of disease germs. It is in such a fertile soil that the spores of disease germs thrive best, simply from the fact that such effete matter tends to form an insulation that prevents or greatly retards the flow of blood and the union of the two great vital forces within the tissues, the union of which constitute the vital current, vital to tissues and destructive to germs. Consequently disease germs are neither inhibited nor destroyed after finding lodgment; while the toxic products thus produced become poisonous to the tissues, weakening and destroying their function and finally producing death of the cell nucleus from loss of oxygen, which destroys the life of the tissue, the field thus being rendered fertile for the propagation of disease germs. Whether the germ produces the disease or the low vital state of the tissues produce the soil and condition most suitable for the propagation of germs, the germs being no more than nature's scavengers, whose work is to produce the dissolution of dead tissues and all material obstructing the flow of the vital current and vital fluids of the body and in so doing assisting the work of eliminating such diseased products from the system, whereby the forces of nature may become established in healthful vital activity, is a question worthy of careful consideration. Whichever view may be true, we know that a low vital state of the tissues is productive of diseased conditions and we do know that maintaining a healthy vital flow of all vital fluids and currents within the body is productive of health and vitality to all bodily tissues and promotes the storage of vital force within the dynamic centers within the body. To reestablish and maintain these conditions should be the prime object in treating all diseased conditions of the human body; especially during the long summer months in the torrid and low temperate zones, where the atmosphere is greatly devitalized from the great depletion of solar vital energy, where the days are relatively so much shorter and nights longer than nearer the poles, thus filling the atmosphere with relatively more of the terrestrial and less of the solar electrical influence, with a consequent less degree of residual solar vital energy remaining in the atmosphere than exists in latitudes nearer the poles.

CHAPTER X.

THE EFFECTS OF BOTH THE RECIPROCAL, AND THE NON-RECIPROCAL RELATION BETWEEN THE EARTH AND THE SUN—UPON THE SEASONS OF THE YEAR, UPON VEGETATION AND UPON ANIMAL LIFE EXISTING UPON THE EARTH'S SURFACE.

While the earth swings in its orbit around the sun, bringing the various seasons—of springtime, summer, autumn and winter, thus marking the cycles of time, the influence of the reciprocal action between the sun and earth is likewise felt in marking the cycles of life springing into activity, growth, maturity and repose as exists in both the vegetable and animal kingdoms. After the repose of winter and with the advent of spring all nature seems to awaken from a state of mere torpid existence to a state of activity. As the sun's rays day by day carry that vital element capable of awakening and developing life whenever it finds an affinity within the earth of sufficient magnitude with suitable conditions, to accept and nurture the vital spark that the sun's rays may awaken into vital action, so in a biological sense we are reminded of the analogy between the male and the female and shall therefore designate the sun's energy as possessing the elements of the masculine and that of the earth, one hemisphere at a time, as partaking of the nature of the feminine. The springtime marks that period of the year in which one hemisphere of the earth passes into a state of repose, while the other receives from the sun the vital elements with increased heat by the coalescence of the vital or the electrical currents in each. Such portion of the earth is thus warmed and impregnated with that vital energy capable of being imparted to the shrubs, the herbs, the grasses and in fact to all vegetation and to all that grows. Animals partake of that vital influence and awaken into renewed life, energy and various phases of vital activity. All the earth in that hemisphere seems to awaken into a field of gladness. The gradual break of winter and the advent of spring is heralded by the songs and mating of birds, the song and cackle of the hen, the crow of the cock, the drum of the pheasant, the gobble of the turkey, the neigh of horses, the low of cattle—in fact all living creatures are filled with joy and indicate their feelings of gladness in some manner. Animals mate, the budding of trees and the first sprigs of grass all indicate the wonderful change that is being wrought within the earth. Both vegetable and animal kingdoms, in fact all nature, seems aglow and to herald with joyful note the advent of renewed life upon the face of the earth. Even the jargoned croak of the bull-frog has an air of gladness, while its voice mingles with that of the whip-poor-will and joins the cricket's chirp in giving a monotonous music, that breaks and gladdens the stillness of the nights of pleasant springtime. What has wrought this change? Cold is the heart and indifferent is he to the language and beauties of nature, who can witness all these many joyful manifestations of life, while breathing the soft pure air of springtime, feeling the pure warm rays of sunshine, that causes the plant to put forth its leaves and the grass its tiny blades, changing nature's coat of brown to that of a beautiful green, indicating the awakening of old mother earth from her slumber into a life of joy and activity; indeed dead to the language of nature is he who can witness these many manifestations of life with all its joy and not feel an exultation of soul springing up within his own bosom, indicating that he too responds to the voice of God in nature as this wonderful vital influence is filling his soul, permeating his very being, bringing that joy that gives evidence that he too is alive to nature's language, influence and feelings that call forth a glad response to the wooings of nature from those not dead to that sublime influence with its inward beauties, realities and truly happy states that can be better felt, than told by him who catches the rhythm and tunes his heart to the chimes of nature.

Again I say, what has wrought this change? It is but the result of the change within mother earth, produced by the coalescence of that vital wave from the sun with a reciprocal state now existing upon the earth.

The earth has again changed electrically, so that for want of a better name we have called it an electrical state that exists between one hemisphere of the earth and the sun, wherein such hemisphere of the earth now receives the electricity emanating from the sun. It will be remembered that on Dec. 22nd all the area between 19°37′ north latitude and the arctic circle was electrically positive. As positive electricity has no affinity for the like electricity of the sun, therefore there would be none, at most, the minimum interchange between the earth and sun during this season, consequently but little heat is generated and the phenomena of lightning resulting from atmospheric electrical union occurs but seldom. Yet the moment that the ecliptic started on its northward journey that moment the winter line began to recede from latitude 19°37′ north latitude, and pass northward. The unilluminated area around the north pole began to grow less and recede from latitude 66°32′20″ and approach the north pole. Thus as the veil is gradually lifted over the negative area of the earth the sun's rays are admitted and find a ready response from the earth over this newly exposed area. Thus the conditions that held the earth covered with the winter influence positive, are gradually lifted and such surface of the earth is released of that condition after the lifting, consequently such newly changed areas are subjected to alternating diurnal influences from positive to negative. Thus the influence of the sun is gradually felt upon the earth and the earth becomes responsive to the sun's influence slowly following the course of the winter line on its northward journey to the north pole, retarded of course, by the loss to the latent heat of the atmosphere and to the heat of the earth during winter months. We thus see how the season of springtime is gradually ushered into all latitudes from the winter line to the poles, the amount of heat received being approximately relative to the mass of any section of the earth parallel with the line of the ecliptic at any given latitude. The northern hemisphere is thus gradually made responsive to the sun's vital powers, and thus becomes impregnated with the vital influence of the sun's rays only in due time to bring forth her myriad manifestations of life and her abundant products of life and joy upon the earth as everywhere indicated in her vegetable and animal kingdoms. As the northern hemisphere is thus responding to the sun's influence and again awakening to renewed life, similar areas along like latitudes in the southern hemisphere are as gradually changing to states giving less and less response to the sun's influence, thus her crops are ripening and her autumn season is approaching as the earth swings in its orbit around to that point, marking the beginning of the winter season. Not only in the germination, but throughout the entire growth the sun's rays have their influence in the vitalization, growth and maturing of the individual unit, whether that be plant or animal. Plants differ from animals in that they are more localized and draw the greater portion of their substance from the earth. They are thus stationary and receive the full influence and effect of either the sun or the elements in whatever position they may be placed; while with animals they may change their position relative to either the sun or the elements and receive their nutrition through the food taken and the air breathed. Yet both plants and animals are influenced by that vital state existing between the earth and the sun. Plants either pass into a state of rest or die whenever that vital state ceases a certain state of activity, thus they are subjected to the state of the earth and surrounding atmosphere. Animals seem to possess a unit within themselves to a certain degree alike, yet in a sense independent of the earth, capable of responding within themselves to the vital state of the sun. Some animals do not possess this independence to the same degree as others, hence when the earth passes into her state of non-responsiveness to the sun's rays, heat ceases to be generated by electrical union or rather lessens in degree, cold results and those animals after a time pass into a torpid state of vitality and pass the winter season in that manner. Such are called hibernating animals. Other animals seem to have the power to retain a more active vital state throughout the year. Thus from the food they take, they have the power of assimilating that food and transferring it into heat sufficient to retain life and to a certain extent live independently of the state of the earth. Yet not wholly so, for the earth may not momentarily perceptibly effect one, yet after a time one can detect a change that has been wrought upon both vegetation and animals. It will be seen soon after the equinox and the electrical flow has changed its direction toward the illuminated pole and the electrical pressure has ceased from an upward flow in all vegetation within that hemisphere now having the unilluminated pole, that plant growth ceases to become so vigorous. The sap in trees appears to flow from the stems toward the roots, leaving the leaves, which soon thereafter turn the color of their hue, the twigs of leaves thus robbed of their nourishment soon loosen and fall to the ground. Thus the slow but sure effect that vegetation is receiving from the turn in the direction of the electrical flow, is shown and felt upon and within all plants and vegetable forms marking the change preparatory to the closing of another cycle wherein is found that vital rest during the winter season marking the passing away of the active period and the ushering in of another, the recuperative period preparatory to the beginning of a new cycle of life during the succeeding season.

No less change is being wrought upon the animal kingdom, both in their states and manifestation of feelings. During the autumn and winter seasons the blood becomes enriched with an increase of red corpuscles, possibly due to that increase of the residual solar electro-vital energy in the atmosphere breathed, due to its not being depleted through an active reciprocal state between the earth and the sun, which is now gradually ceasing.

In animals the hair and fur thickens. Birds in autumn molt their feathers, followed by a thicker plumage for the winter season. With undomesticated animals the disposition to beget offspring is temporarily suspended during the approaching cold of autumn and the early winter season, thus instinctively acting in obedience to the unresponding state of the earth to the sun. Thus, with the earth, they pass into a state or period of sexual indifference, rest and recuperation. In tropical climates this influence is not to such an extent felt and animals may produce their young throughout the year, or if suspended at all, to a correspondingly less period of time. As the winter is last in reaching and the first to leave equatorial climes, so this influence is felt and for a less period of time throughout each year; consequently animals and plants are less effected by the influence of winter as we approach the tropics. As the sexual influence is felt most forcibly over the body during periods when the earth in any particular clime reciprocates with the sun in vital or electrical interchange of mutual affinities and as this condition is most prolonged in climes nearer the equator, so will all animals and mankind as well, be alike subjected to this influence. Thus their sexual functions will receive a shorter natural check and will be subjected to longer natural periods of development each year than with animals and mankind more remote from the tropics subjected under natural conditions to longer winter periods. For this reason the child of tropical climes will mature earlier and arrive at the age of puberty at a younger age than the child more remote from the equator or in temperate climes not beyond 66°32′20″ where the electrical state of the earth changes.

Vital energy within the atmosphere increases from the equator to the poles for the reason that the earth neutralizes relatively less of the sun's energy from the equator to the poles, as the mass of the earth relatively decreases from the equator to the poles. If a sunbeam strikes the earth at the equator, that sunbeam must be sufficiently strong to more than neutralize the full force of the earth's electricity at that point. If not there will be no residual vital energy left from the sun's rays. But if the sunbeam is sufficiently strong to counterbalance the electricity of the earth and have left a residual supply; that supply may be utilized by any substance having an affinity for such vital heat producing energy. As animals in a sense are distinct units, such energy may be utilized by animals, which is done by being breathed into the lungs under the form or accompaniment of oxygen. If the earth neutralizes any given per cent of the sun's energy, striking on the equator, then with approximate accuracy we may compute the amount of energy rendered latent at any point distant from the equator, the energy increasing relatively with the decrease of the earth's mass from the equator, along the line of extension of the sun's rays if extended through the earth. Thus the atmosphere along equatorial climes possesses relatively less residual vital energy, and is less invigorating and not capable of imparting to individuals the same degree of energy that the atmosphere is capable of doing more distant from the equator where less energy is neutralized in generating heat. Thus mankind in such climes are less invigorated and energized by the air they breathe, consequently less energetic than mankind more distant from the equator. Consequently such persons generate less bodily heat and have less disposition to work or to take energetically to any business requiring much activity, a characteristic they are not altogether responsible for having, as they are creatures of circumstance, influenced by an unseen, but ever present condition of oppressive devitalized atmosphere that fails to supply them with that vital energy supplied to and manifested in people in climes more distant from the equator, where a greater degree of vital energy exists in the atmosphere. This condition is compensated by the greater variety of products, and the consequent ease of obtaining food within tropical climes. As the heat of the surrounding atmosphere in tropical climes is such that the body is not required to produce an excess of heat to compensate for absorbtion by cold as in northern climes, consequently the heat producing energy of the air breathed is not so much required as in colder climes. As the sun's rays during the winter season strike the earth at such an incline as to effect a less mass of the earth and consequently, even if the earth were electrically responsive, would tend to neutralize the least energy possible, a condition tending to leave the greatest residual solar vital energy latent within the atmosphere; consequently the heat producing energy is greatest during the winter season of the year in the air breathed, consequently capable of producing the greatest amount of bodily heat when breathed, which assists the person or animal in colder climes to endure the intense coldness of the winters of such climes. It is doubtful if the amount of energy within the tropical atmosphere would raise air at 30° F. or more below zero almost instantly to blood heat within the lungs and cause the blood to flow with warmth and comfort throughout the body, yet that is true with people in climes remote from the equator, when breathing the heavily laden solar vital energized atmosphere of high latitudes. If the body can be sufficiently clothed to prevent the radiation of the bodily heat, one can be comfortable as long as the inward carbon food supply lasts. Thus such people require more food and more heat producing properties, in their food, which should be heavily laden with the carbon element, capable of producing fuel for the inward combustion thus produced, resulting in animal or vital heat within the body.

CHAPTER XI.

SURFACE HEAT MODIFIED BY ATMOSPHERIC AND OCEAN CURRENTS—ALTITUDE OF MOUNTAINS.

The movements of the atmosphere have their influence in modifying any climate. Climates in the northern hemisphere subjected to south winds, have less vital energy, experience more heat and a less invigorating atmosphere or a less degree of vital energy within the atmosphere, while climates subjected to northern winds are colder and the atmosphere is laden with a greater degree of vital energy, consequently more energizing than the atmosphere influenced by south winds. Ocean currents have their influence in modifying a climate as is shown in the Arctic currents that sweep the eastern coasts of continents which are colder, while the western coasts of continents are rendered warmer. This condition is due to the direction of the polar currents dropping westward and towards the equator, sweeping the eastern shores, while the tropical currents travel eastward and toward the poles as they pass from the equator, consequently washing the western shores of continents, the former having a less degree of momentum, while the latter has a greater degree of momentum due to the difference in the velocity through space of currents upon the surface of the earth, while the earth makes its diurnal revolutions, the distance and velocity increasing from the poles to the equator. From such modifications of climate the same latitudes upon all parts of the face of the earth are not of uniform temperature, consequently great variations of climate, due to the interchange of heat and cold through ocean currents, streams and winds upon the face of the earth. So with elevations in altitude from the sea level. High altitudes and elevations reaching less dense strata of air will be relatively stronger in the properties of the sun's electricity and less effected by the changes due to the reduction of solar energy by the production of heat at the earth's surface. Thus the tops of mountains may be covered with snow while at their base it is warm and pleasant, with flowers in bloom and every evidence of existing summer prevails.

The sun's rays are just as strong upon the mountain top as at its base, so is the earth's electricity just as strong—locally much stronger. In fact the top of the mountain generates more heat per square foot than is generated at its base from the fact that it extends higher into the air than the surrounding land, consequently it will tend to form a good conductor for the electricity of the earth to pass upward and unite with the solar electricity, yet the heat formed by such union is by its close proximity soon diffused into the higher strata of the atmosphere through the breezes flowing from such high strata against the mountain tops, hence heat is not so liable to accumulate upon mountain tops, consequently not so readily perceived as at the base. As the affinity of the earth's electricity will tend to draw on the mountain top somewhat from the adjacent rays and strata of air, consequently the phenomena of electrical union and currents, as lightning, etc., will be more prevalent upon the mountain sides and tops than at its base; yet the heat thus generated will tend to radiate into the surrounding atmosphere of cooler strata of air and not accumulate the heat necessary to protoplasmic activity and to the growth of plants, as it will at its base where radiation is not so great, where the heat thus formed is uniformly distributed to the surrounding atmosphere of more uniform temperature and density, having that electrical combination necessary to the growth and sustenance of plant life.

CHAPTER XII.

THE INFLUENCE OF THE SOLAR AND TERRESTRIAL ELECTRICAL UNION UPON THE RAINFALL AND SURFACE MOISTURE OF THE EARTH.

(See Plate X.)

It has been observed that the growth of trees increase the rainfall of any locality. For this reason our Congress has made certain very favorable inducements in our homestead laws intended to promote the planting of trees upon the arid lands of our western country. Yet with the inducements given to promote tree culture, it can hardly be said that the growth of trees has been carried to that extent, nor has the planting of trees been rewarded with that degree of success, to secure the object intended by our congress, in promoting the amount of rainfall over such localities necessary to the natural demands of growing crops. Yet notwithstanding the general failure to grow trees successfully upon such arid lands there has been a general increase in the annual rainfall of our western country, so much so, that it is said that "Rainfall follows civilization." It is a fact that much of what was once considered a barren desert save for the scanty buffalo grass that grew upon its surface, has now developed into vast wheat fields. Many districts for the last few years have been visited with such an increase of rainfall that farming has been pushed and extended to include much land that was formerly considered utterly worthless, that is now yielding rich returns to a hardy, persistent and energetic people.

If tree culture has not met with that degree of success that was once anticipated by our congress to be of sufficient influence to cause such increased rainfall as to produce a change in climatic conditions, then to what can this change be attributed, for in fact there is a change and a great change at that?

While the writer would give due credit to such influence as the presence of such scanty groves and what few scattered trees may have upon the change in climatic conditions over our western country, yet he would look into the reason why forests themselves augment the rainfall of a locality and if we can discover the principle involved and the forces acting to bring about such climatic conditions and then, if we can, account for this phenomenon of increased rainfall along natural lines that may be utilized to further augment the rainfall and further induce the growing of crops and general productiveness of our western lands and over all districts wherever found, throughout the entire world as well, where an increased rainfall may be needed, we shall feel that our labors have not been in vain.

God who gave mankind a reasoning mind, and in so doing placed him in a superior position over the brute creation, has intended that man shall be free to use that mind in the discovery of natural laws and make such intelligent application of such discoveries to the forces and material that God has placed at the disposal of mankind as may further augment the happiness and general welfare of all mankind, that in so doing mankind shall receive and enjoy the fulness of the blessings of a beneficent and generous Creator. Truly we, who live under the protection of the stars and stripes, are blessed in that our God-given rights of freedom of thought and speech are not in the least curtailed by the tyrannical dictates of any mortal being.

Beneath the surface of the earth we have subterranean streams that are fed by water sinking into the earth after a rainfall or from overflow of streams that form the outlet to surface waters. Under our arid districts we have subterranean streams that represent the overflow of the mountain snows and rainfall that sink beneath the desert sands and make their way to the sea by subterranean streams and sheets of water through strata of sand and other pervious substances. It is said that prairie dogs dig holes down until they find those subterranean streams from which they secure their water supply.

Most any observing farmer has noticed how that the freshly stirred soil shows an unusual dampness when compared to the adjacent soil not so recently stirred. During periods of dry weather ground that is freshly stirred as by surface plowing of corn rows will show in the early morning an unusual dampness as compared to the adjacent rows of soil not so stirred which by remaining unstirred remain dry and parched. Ground so stirred will show that it has gathered an unusual degree of moisture from some source during the night. This dampness, as the day wears on, will become to a certain extent evaporated by the influence of the sun's rays and the adjacent molecules of air, or sink deeper into the earth after the neutral point is again established for the day between the earth and the solar rays. What influence has produced this moisture? Tides are said to be produced by the influence of the sun and moon upon the earth. The influence of the sun and moon are no less exerted upon the land areas of the earth than upon the waters of the earth. If the sun and moon will exert an influence sufficient to cause the tides upon our oceans, then they will exert a like influence upon our land areas. The reason that the influence is not perceived upon the land is that the land is less yielding than water, hence the influence is not as readily perceived. It is the opinion of the writer that capillary attraction is no less than this unperceived influence of the sun and moon upon the surface of the earth acting where the calibre of the tube is sufficiently small to materially utilize the force of adhesion, thus producing a combined force sufficiently great to slightly overbalance the force of gravitation, consequently we have the force designated as capillary attraction acting through tubes of small calibre, bringing liquids to higher levels than it is possible for liquids as a mass to attain.

Thus we have the combined force of the sun and moon at times and at other times each acting singly to produce an upward flow of the waters of the subterranean streams, which by the adhesive force of the soil through which such waters are drawn combining with the solar and lunar forces enable the water to be drawn upward against the force of gravitation until it reaches a certain point which we shall designate as the neutral point,the philosophy of which we will now endeavor to consider.

In our explanation previously given in this work of how the earth rotates on its axis we endeavored to show that the attractive force between the earth and sun remained active so long as the surface of the earth remained negative and how that just as soon as the surface of the earth became positive that attractive force ceased and a repellent force gradually developed in its stead. Later on in this work the reader will find that the writer is of the opinion that the union of the solar with the terrestrial electricity forms a new neutral electrical molecule held in loose combination that represents a satisfied affinity, each element for each, that is the solar electrical element becomes satisfied and its affinity ceases for the terrestrial electrical element, while the same becomes true of the terrestrial electrical element for the solar electrical element. The presence of the heat developed by this electrical union produces an expansile force which being resisted by the presence and flow of both the solar and the terrestrial electricities develops a repellent force, which acting against the lighter body, the earth, causes it to revolve in a direction away from such resisting force, hence the earth being drawn in a direction toward the sun on the westward side of the zenith line where this force has not yet developed, while it becomes pushed away from the sun on the eastward side of the zenith line where this force has become developed, causes the earth to be constantly revolved upon its axis, giving us the earth's diurnal motion from west to east upon its axis.

The combining of the solar with the terrestrial electrical current over the face of the earth most especially to the eastward of the zenith line, produces a neutral point at the point of union, having no affinity for either the solar or terrestrial electrical flow. This point as it widens into space by the formation of new neutral molecules produces an interval that finally reaches that degree of expansion where the electrical current becomes insulated, or divided, and by the presence of heat produced by the combination of the solar with the terrestrial electrical flow causes the new neutral molecules thus formed in loose combination from its gaseous nature to expand more and more while new molecules are being formed and expanded, until the pressure becomes sufficient to cause the body of least resistance to be moved, as in the diurnal movement of the earth. The earth rotating, constantly rotates the position of pressure away from the line to the sun, thus giving the newly formed molecules an opportunity to further expand until their degree of expansion becomes so great that the weak affinity existing within each element is no longer strong enough to hold the new neutral molecule in combination, hence a dissolution of the neutral molecules by the expansile force of the heat produced by the union within the molecule, the hand representing the constant terrestrial affinity for its own kind within the molecule, drawing the terrestrial electrical element thus freed back to the earth while the solar electrical element drifts into line with other solar rays passing from the sun to some other heavenly body beyond.

In treating the subject before us, it is the neutral point thus formed to which we wish to call the attention of the reader. As we have said, the attraction existing between the earth and moon and the earth and the sun is sufficient to cause a rising en masse of the waters of the ocean producing the tides, so upon the land areas of the earth that same force still existing becomes exerted in drawing every portion of the earth outward against the force of terrestrial gravitation. The molecules of water being free to glide upon each other and not being held by the force of cohesion as in the solid portions of the earth, are thus drawn from their position of equilibrium and forced to ascend against the force of terrestrial gravitation until that point is reached in the earth's diurnal revolution wherein the zenith line is reached and they become subjected to the presence of this neutral line just described which assists to neutralize the force of the attracting heavenly body, as the sun or moon, while the terrestrial gravitation still remaining active causes the waters to again seek their natural position of equilibrium. It is the solar and lunar forces acting either singly or combined that causes the water existing in the subterranean streams flowing under the earth's crusts, to ascend through porous rock and earth and by their adhesive force as before described produce the force designated as capillary attraction, which assists in raising the moisture thus attracted to the surface of the earth or to the position of the neutral point wherein this attractive force becomes annulled.

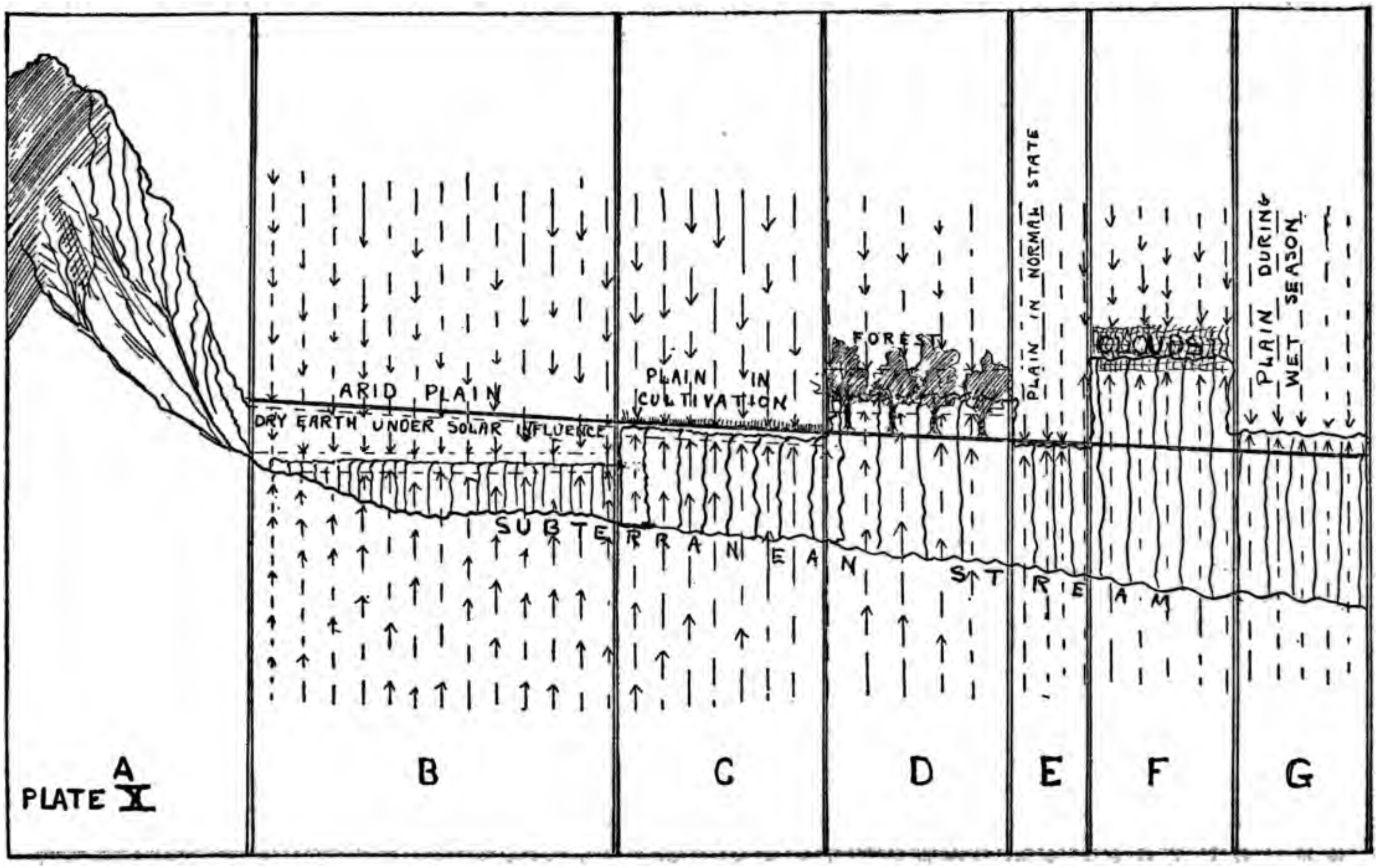


PLATE $\frac{\text{A}}{\text{X}}$

Should the subterranean stream be comparatively close to the surface of the ground, the solar and lunar forces may be sufficiently strong to enable the moisture to flow to the surface of the soil before the point of contact of the solar and terrestrial or the lunar and terrestrial electrical current is reached. This point of contact being the neutral point, then the roots of plants and all vegetation within the soil through which such moisture may be raised will receive moisture and become bathed with water to supply the natural demands of the plant, while the excess may be drawn upward to assist in forming dews and fogs, and in raising the general humidity of the adjacent atmosphere, augmenting the clouds and general rainfall upon the earth. Should the subterranean streams become settled deeper beneath the surface of the soil, as in periods of long drouths, or general dry weather, or exist far beneath the surface as is the case generally over the arid portion of our western plains, then it is that beneath the surface of the soil the plane of union may occur between the solar and the terrestrial and between the lunar and the terrestrial electrical flows, this plane then becoming the neutral point above which the subterranean moisture cannot rise, as the force that draws it becomes neutralized when this neutral point becomes formed, this point or plane acting as an insulation, wherein the expansile repellant force is developed and becomes active. Should the subterranean stream be sufficiently deeply situated beneath the surface of the soil and the surface soil become sufficiently dry to enable it to absorb all the moisture raised during the interval between the release of the neutral point and its reformation on the subsequent day, thus preventing the saturation of the upper stratum of soil with moisture, then the heated surface soil will the more readily become transformed into a positive state by the action of the solar or lunar rays and in so doing cause the neutral point to descend the deeper each day until such point may descend too deep to permit any moisture to be raised to the surface during the cessation of the neutral point during the hours after midnight to noonday. Thus it is that the surface of the earth during periods of drouth or extremely dry weather and the surface soil of our western plains become extremely dry, almost if not entirely destitute of all moisture. The reader will understand that the moisture is raised by solar and lunar attraction, possibly by that electrical attraction existing between the earth and the sun, and between the earth and the solar electrical state of the moon acting upon the surface of the earth, either singly or in conjunction with the sun as hereinafter described in this work. The solar and lunar forces acting to draw the moisture upward until the terrestrial and either or both the solar or lunar electricities unite, the union of which cause heat to be formed, this heat acting to vaporize the moisture thus raised, which, if this point of union be raised to the atmosphere, becomes the medium to increase the humidity of the atmosphere, producing rain, etc. But if this point of union takes place beneath the surface of the soil then the vapor thus liberated serves to add to the general moisture of the soil at and near the point of union, the neutral point serving to insulate the electrical flow and allowing the moisture to be drawn back or settle downward by the general force of gravitation. Thus if such dry condition becomes sufficiently prolonged, reaching over periods of ages, as has been the case upon our western plains, then this point of moisture will become sunk far beneath the surface of the soil, leaving a deep interval of dry earth beneath this point and the surface of the soil. The dryness of this soil will enable the solar electrical influence the more easily to penetrate the surface and the surface to become the more easily rendered positive and a consequent deeper penetration of the solar electrical influence before reaching the terrestrial electrical influence, thus increasing the solar and minimizing the terrestrial electrical influence, while the point of electrical union is deepened, causing the moisture to become diffused at deeper depths while the heat produced at such point of union is produced at a deeper depth, thus producing and augmenting the neutral electrical states at lower depths, rendering the overlying soil the more easily influenced and controlled by the positive electrical influence of the sun or the same reflected by the moon. Thus it is that conditions are produced conducive to the continued dry and arid state of soil subjected to such conditions. The question now arises, how can such a condition be changed so as to bring the water or moisture from subterranean streams to the surface of the soil, to supply the rootlets of vegetation and augment the rainfall upon the surface soil of such regions?

In the writer's opinion, this can be done by so interfering with the passage of the solar and lunar electrical currents as to cause their check at some point while the terrestrial electrical flow is permitted to rise to such point bringing the subterranian moisture to such point to become vaporized at such point. It is the opinion of the writer that this is done by surface stirring of the soil, and by producing a sufficient vegetation foliage to check the solar electrical influence giving the terrestrial electrical current an oportunity to rise to such point, while if the roots of such vegetation can be kept on the terrestrial side of the neutral point they will become bathed and watered by the surface moisture thus raised, while the foliage will give an opportunity for the solar electrical influence to act upon the plant producing the electrical union within the plant, with the plant as the medium or occupying the position of electrical union where such union acting within the embryo of each vegetable cell causes the plant to thrive and grow into maturity as described elsewhere in this work.

It is by the checking of the force of the solar rays that the foliage of trees becomes productive of rainfall. This is done by the checking of the solar rays and preventing the positive electrical flow from entering the earth, thus inducing the negative terrestrial electrical flow to flow upward, bringing its subterranean moisture until it meets the positive where such moisture is vaporized at the point of union, the moisture serving to augment the general humidity of the surrounding atmosphere, which usually occupies the interval between the surface soil and the foliage which by its general admixture with adjacent strata of air serves to bring such atmosphere to a point of saturation or by augmenting the clouds and their rising and the cold reducing the intermolecular spaces of the air until the existing humidity is raised to a point of saturation produces rainfall upon the surface of such regions.

Thus it is that rain is caused to follow civiliatizon by our hardy, sturdy, energetic, persistent pioneers who have from year to year plowed and caused the surface of such arid districts to be thoroughly stirred and the solar electrical flow to be checked from penetrating so deeply into the earth for a period of years which has caused the terrestrial electrical flow to rise higher year after year, bringing upward the line of saturation until the subterranean moisture over many districts has been caused to reach the surface and by giving its moisture to growing plants and crops has induced a foliage that served to further check the solar electrical flow from penetrating the earth, thus bringing the point of electrical union and the line of vaporization apast the roots and to the surface soil and even to the foliage of vegetation. In this manner the line of electrical union and vaporization has been raised to the surface, permitting a surplus surface moisture to augment the general humidity of the atmosphere, rendering conditions conducive to an increased rainfall, which has indeed followed the track of the settler and has become the rightful fruit of a persistent effort at civilization over our arid western country.

Thus by the persistent stirring of the surface soil and in so doing breaking the solar electrical current upon the surface of the earth, which permits the terrestrial electrical current to rise higher, bringing its subterranean moisture during the interval that the solar current may have become thus broken and meeting the solar current, that soon becomes re-established, at a higher level where the neutral point becomes established, liberating the moisture thus raised to such point. Thus by successive surface stirrings—and in so doing successively breaking the line of the solar electrical flow and permitting each time the rising higher of the terrestrial electrical flow, bringing its moisture from subterranean streams before the point of solar and terrestrial union is again established, forming another neutral point where such moisture is again liberated, that such point of electrical union is finally brought to the surface soil where the moisture liberated may bathe the roots of vegetation, and where the heat generated at the point of contact of such currents serves to warm and further assist in the germination of seeds and further growth of vegetation. After vegetation once covers the surface of the soil its foliage will assist to further check the passage of the solar electrical flow and permit the terrestrial electrical flow to rise to the surface and continue to bathe the roots of vegetation and possibly permit a surplus, if any, to be given to the surrounding atmosphere, where it serves to increase the humidity of the atmosphere, which, if sufficient, serves on rising to augment the clouds and increase the possible rainfall over such locality.

Thus, although not perceptible at first, yet by persistent effort on the part of the hardy pioneer and those who may have followed him in more recent years, the moisture has been raised from subterranean streams to the surface soil, giving nourishment to vegetation, which has by its foliage further increased the moisture within the atmosphere to the further production of local showers and the increased general rainfall; while the soil of the earth has been induced to blossom and to give forth bounteous harvests to reward the labors of the sower in his persistent effort to secure his bread and gain a home in our arid western lands. Thus it is that as the country become more and more settled and the soil of the primitive desert becomes broken and more and more of it each year becomes changed from a native desert state to a plowed soil with the plow, the harrow and the disc well applied, that the solar electrical influence becomes the more checked by local surface disturbance, while the terrestrial electrical current is induced to flow upward bringing moisture from subterranean streams as by capillary attraction through the porous soil until it meets the solar electrical current at the line of this local disturbance to the surface soil. The union of the solar electrical current results in the usual production of heat at the point of union or neutral point, which serves to vaporize the attendant moisture, which becomes absorbed by the adjacent molecules of air, or if slightly under the surface of the soil to moisten, warm and germinate any seed sown, thus inducing the growing of crops thus sown. If surface stirring and frequent surface disturbance of the solar electrical current is continued until the underlying strata of earthy substance are well saturated, thus rendering it the less probable for the solar electrical influence to again soon sink beneath the surface of the soil, while the growth of plants already sown are giving forth their foliage to further check the intensity of the force of the solar electrical current, then the terrestrial electrical current becomes further protected and is longer induced to flow upward, bringing its moisture, bathing and further supplying the roots of plants with necessary moisture. Retaining the neutral point between the solar and terrestrial currents within the line of growing plants, further hastens their growth by their being fed by the solar influence through the blade while the terrestrial influence is supplied through their roots while the formation of vegetable cells in plant growth is rendered possible and further hastened by the heat and moisture thus liberated at the neutral point or point of electrical union, which being in close proximity to vegetable embryo, causes the seed to germinate new vegetable cells, which again multiply to bring forth new vegetable cells forming plant tissue to form roots, stalks, stems, blades and even to the maturing of the full grain for the harvest. Most any farmer has observed how his crops will not grow during periods of extremely wet weather, also that the same condition exists during periods of extremely dry weather. Such conditions in the retardation of the growth of vegetation are due to the positon of the point of electrical union between the solar and the terrestrial electrical flows, which immediately after such existing affinities are satis fied, becomes the neutral point.

During periods of extreme wet weather the plane of electrical union is raised above the rootlets and even above the foliage of vegetation, the solar electrical current being retarded by the overlying cloudiness and the insulating influence of a humid atmosphere, which allows the terrestrial electricity to rise above the surface of the ground, the rootlets and even above the blades of vegetation, thus retarding the growth of vegetation, crops, etc., which if long continued gives the plants an appearance commonly expressed as scalded; such condition serving either to entirely destroy or to greatly injure the future growth of such vegetation. The growth of crops may likewise be retarded by the soil becoming extremely dry wherein the point of electrical union becomes sunk even below the rootlets of vegetation. Thus the solar meeting the terrestrial below the roots of plants neutralizes the terrestrial electricity and prevents the moisture from rising to the rootlets, thus cutting off a necessary element of germination and growth, both the moisture and the earthy principle. It being the view of the writer that germination takes place at such point of union, consequently all cell growth is dependent upon such electrical union, whether of plant or animal growth, the earthy principle being represented in the food eaten by animals, as given elsewhere in this work. Thus it will be seen that in order to secure the most effectual results in farming, the soil must be so managed that the point of electrical union, which is called by the author the neutral point, shall be kept near the surface of the earth, where the cells that form the roots, stalks, stems and blades of plants, may receive that vital stimulus necessary to germination, growth and maturity in all vegetation.

Thus soil that becomes so extremely wet as to raise the neutral point above the roots and even at times above the stalks and foliage of vegetation, must be so drained as to reduce the neutral point within the area containing the roots and never above the stalks and blades of vegetation, in order that the roots shall receive the terrestrial electrical flow while the stalks and blades shall receive the solar electrical flow, with the neutral point meeting as nearly as possible within the growing plant and as near the area containing the roots as possible to obtain.

With soil that the solar electrical influence is liable to penetrate below the roots of growing plants, it will be necessary in order to obtain the most effectual results from such soil, to mulch the soil by the spreading of manure and straw, and to frequently stir the surface of such soil in order to break the solar electrical current and if possible prevent it from penetrating too far below the surface of the soil and thus prevent the roots from obtaining moisture from subterranean streams, which will be prevented if the neutral point is allowed to sink and remain below the roots of growing plants.

It will be noted that the spreading of manure upon the surface of the soil is a very effectual means of producing a stasis to the solar electrical flow; so it is within the human body and within all animals for that matter, that the refuse of the animal cells surrounding the tissues is an effectual stasis against the flow of blood and most especially the solar electro vital energy contained within the blood from penetrating all tissues ladened with the effete refuse from living cells. In other words the neutral point seems to become established at the point of union between such effete matter and the solar electro vital energy contained within the hemoglobin of the blood. Thus it is that solar energy will not mix with filth but sets to work with great energy to consume and destroy if possible by dissolution, resolution or otherwise such effete matter.

Thus it is that year by year the deserts are being gradually changed from barrenness to fertility, while the seasons and climatic conditions over such districts are being changed to increasing dews of the morning, with more frequent and more copious rainfall upon the land. Thus it is that the forces of God, in Nature, go hand in hand with man in assisting and rewarding the labors of mankind, whenever and wherever such efforts shall harmonize with the requisites of natural law in fulfilling those conditions in nature so necessary to supply the most simple as well as the most ample needs of mankind. Hence how necessary that man shall be free in both body and mind to study the forces of Nature and apply them to his own welfare and comfort. Without such freedom it is impossible for man to develop and cultivate his own innate God-given faculties, consequently he must remain with faculties latent, undeveloped and even starved and diminished from want of mental food and proper cultivation; therefore man in such condition is destined to remain in ignorance, to become the servile tool of those who are in a position to take advantage of his ignorance and mental weakness. Hence any principle in either government or in religion that would confine any achievement of the human mind in the discovery of truth in the realm of nature; that would limit human knowledge and attainment within stale dogmas of despotism; that would give no higher service to mankind than to become the servile tool in business, state or church to further bind and perpetuate the fetters of poverty, ignorance and superstition upon poor, weak, ignorant, helpless human beings; that would crush any worthy ambition or aspiration on the part of any individual to cultivate his own innate human faculties of both body and mind; that would deny to any individual the right to think, choose and make such researches as may better acquaint him with all the bountiful provisions of God in the realms of Nature for every individual being; that would deny to any individual the right to know more of his own God-given human rights, whereby he may claim, demand, attain, possess and enjoy all the rights and privileges accorded through the bounties of God in the realm of Nature to any other human being; that would deny to any individual among mankind any just privilege, whatsoever, to all the bounties of God should be condemned and known as a counterfeit to true principle, whether such debased principle shall be found in business, in government or in religion, as often simulating the Divine while in fact it is the most effectual agency of the devil and most unworthy any respectable recognition from human beings. Such a principle, whether practiced by individuals, state or church, should be disowned, renounced, denounced and condemned by all true friends of humanity as a debase, deceiving and most fiendish enemy to every human liberty, which by all means should be speedily relegated into nonexistence, to be known to man and to exist only in history, as a vile deceiving principle of obsolete human tyranny, practiced only by individuals, rulers and clergy who have gone to the rightful destiny of all human tyrants, traducers of truth and vile deceivers of poor, humble, ignorant, oppressed, yet confiding human beings.

CHAPTER XIII.

VEGETATION AND ANIMAL LIFE—THEIR RELATION TO THE RECIPROCAL STATES OF THE EARTH AND THE SUN AND TO EACH OTHER.

The absence of frost and cold within the tropics makes it possible for a greater variety of life to exist, than exists in either the temperate zones or in the frigid zones. Yet vegetation generally does not make as rapid growth in the torrid zones as vegetation does farther from the equator. That is, vegetation does not grow from seed to maturity as soon within the torrid regions as in colder regions more distant from the equator. The difference is due to certain causes effecting the vital state of vegetation; among these causes may be mentioned the longer periods of rest that the soil gets in climes distant from the equator during the winter season, the deep freezing and loosening of the surface soil, the increased vital state of the atmosphere in latitudes more distant from the equator, the increased length of sunshine due to the increased length of days in latitudes as distance increases from the equator, which enriches the atmosphere with solar energy which with the consequent shortened periods during nights gives a much greater proportion of the constant influence of the sun's electro-vital energy upon growing vegetation than in latitudes nearer the poles.

Thus in latitudes more distant from the equator, vegetation is grown more rapidly and with greater productiveness, while crops mature in much less time than in more tropical regions that do not enjoy such a high degree of residual solar energy; exceptions possibly being in latitudes near the poles where the summer's heat is insufficient to melt the great masses of ice and snow and to thaw the frozen soil in time to warm the soil sufficiently to enable vegetation to grow and mature, save possibly a few varieties of polar plants, mosses, etc.

Possibly plants differ in the variety of vital energy required to sustain and make the necessary growth from seed to maturity; yet it will be observed that tropical vegetation is of more sluggish growth, requiring a longer period of development than plants in latitudes of the temperate zones more distant from the equator.

Plants in their variety and nature are possibly as varied as the nature of the soil and the climate of different portions of the earth to which they are indigenous; yet all are alike dependent upon the earth and the sunlight for an existence. All must have a certain peculiar combination of earthy principles combined with the solar principle in order to develop the germ from which they grow. It requires a variety of soil to develop all the various varieties of plant life. Plants may find in one soil a property that they do not find in another, so they may be as variable in their requirements of some peculiar kind of atmosphere to surround them and from which they may breathe that peculiar combination of vital energy required for their growth which is imparted to the atmosphere by the sun, its degree depending upon the degree of union between the electricities of the earth and sun. Some plants may take from the soil one property and reject another, so they may take from the sun one property and reject another. The sun's rays are doubtless as rich or even richer in variety as the soil and surface of the earth. Possibly the flower adds to its beauty by utilizing many variations of solar ethereal wavelets in the formation of the many delicate colors that enter into its combination. Plants are dependent upon the state of the earth for their growth. Thus during the winter season some enter into a state of repose, others being propagated annually from the seed, while others add to the old stalk by throwing out new buds from which new stems and leaves are formed during the season's growth. Plants are thus dependent upon that reciprocation between the earth and sun conducive to those conditions of heat and moisture necessary to sustain and induce growth in plants. Plants thus glean from the earth and sun those forces and substances necessary for food and fuel to sustain animal life. Thus the plant gathers the material in an unorganized form, taking from the earth and sun many varieties of the earthy and solar principle and holding them in readiness to be utilized by higher forms of life.

The seed of plants, speaking generally, contain the germs surrounded by a substance sufficient to nourish the germ until the roots can be formed that enable the plant to reach down into the earth and extract the substances requisite for its future growth from the earth. This nutritious substance in seeds is usually some form of starch or gum, which, by the aid of sunlight, heat and moisture combined with the earth's soil is converted into some form of sugar, which is the form most suitable for absorbtion by the plant germ, the chemical composition of starch being C 6 H 10 0 5, which by the absorption of water H 2 0, becomes a form of sugar C 6 H 12 0 6, which is absorbed by the plant in embryo, giving it temporary nourishment until the plant is sufficiently strong to receive its nourishment through its rootlets from the earth. The solar electrical current penetrates the surface of the ground where it meets the terrestrial electrical current within the embryo of seeds lying planted or otherwise within the earth's surface. The union of the solar and terrestrial electrical currents within the embryo of the plant seed produces an additional heat and a liberation of moisture at the neutral point or point of electrical union, as already given in this work. Thus by this union heat and moisture are liberated, which being in the area of plant seeds causes the embryo within the seed to spring into active life, having its vital principle awakened and supplied through the solar electro-vital flow combined with the elements of heat and moisture causes the vital spark to reach out and utilize the forces of nature at hand, resulting in tiny blades springing out and reaching upward toward the solar current whereby the solar electro-vital influence is widened and increased as the plant grows, by which it may the more readily connect with the terrestrial electrical currents through the tiny rootlets that now reach downward into the earth to serve the purpose of both absorbing nourishment from mother earth and to the better connect from a widened area a greater amount of the terrestrial electrical force as the plant grows to connect with the solar electrical influence stated above. Thus the earthy matter is gleaned from the earth in an unorganized form and stored within the plant in an organized form. If the plant is cut down before full maturity of its seed, earthy substances within the plant are capable of being eaten and absorbed by the animal eating the same and, on being assimilated, becomes a part of the animal economy. Thus grass is eaten or mown and cured and then eaten in the form of hay, or likewise fodder from corn; either are capable of sustaining animal life. But if the grass or corn perish by being subjected to the disintegrating forces of the elements, the earthy matters lose their organized form, their substances becoming unorganized through decay and no longer fit for food. But if the plants are permitted to ripen, they throw the greater portion of their nutritious substance into their seed, the seed temporarily sealing the nutritious elements from temporary decay by the formation of thin coverings which harden and form temporary protections from the disintegrating influences of the elements, such covering being the husks and bran of grain and seeds. Thus the germ element and the temporary supply of nutrition is preserved in the seed through the winter season until such time as those conditions necessary to growth are produced by the various surrounding influences brought to bear upon the plant germ.

It appears that the electrical union existing between the earth and the sun as exists during the spring, summer and autumn, produces those conditions necessary to growth within the plant germ, heat being produced by the electrical union between the earth and the sun, the surface of the earth and the particles of dust within the atmosphere serving the same purpose that the carbon does to the production of electric light at the point of union of two electrified wires, which results in both light and heat. As before stated it appears to the writer that within the sun of itself heat does not exist as such. It is only when the electrified wavelet passing from the sun meets another similar wavelet from another body, with affinities existing between each for the other, that union takes place. If there exists any obstruction to that union by the intervention of any conducting substance having a less degree of conductivity, that obstruction will result in friction and the accumulation of a greater degree of electrical accumulation and energy at such points of union, which result in heat and a spark of light at such points of union. It is the opinion of the writer that the heat of the earth has its source from the electrical union between the earth and sun, and possibly other bodies in a less degree, as just described, rather than from the sun as the only source of heat. Animal heat within the body is similarly produced by the union of the sun's energy as an accompaniment of oxygen in the air breathed with the terrestrial electricity within the body, which has its source both from contact with the earth and from the food eaten, by means of which it becomes stored within the body, concentrated and insulated possibly within the cells of the sympathetic nervous system from which it extends outward, connecting each living cell and tissue within the body in which it connects with the germ element within the cell, filling each cell with like energy. Here through the provision of the animal economy, the energizing elements from the sun through means of the hemoglobin of the blood possibly become stored within the cerebro-spinal nervous system and brought into contact within the cells containing the earthy elements and forces resulting in electrical union, cell metabolism and the giving off of heat which is necessary to the activity of cell protoplasm, cell growth and the accumulation of force within the animal cell to be expended in the performance of the function of any cell or aggregation of cells within any part, or within the body as a whole. The germ element in the plant is surrounded with a temporary supply of nutrition, which, aided by moisure and heat, is awakened into activity and becomes capable of absorbing the surrounding nutrition and transferring it into its own protoplasm. Thus the life element is enabled to assimilate unorganized material and to transfer it into organized forms. The plant is thus enabled to throw out rootlets into the earth through which it absorbs from the earth material for growth while it throws out a stem into the atmosphere from which it partakes of the elements necessary to growth from the sun. Thus the plant develops in an intermediate position between the earth and sun, each uniting its forces within the cell germ, causing it to grow and manifest all the phenomena of life peculiar to the characteristics of its kind of germ element. Thus a corn germ will produce the growth peculiar to corn and take on all the elements and characteristics peculiar to corn. If the germ is wheat, the growth will be that of wheat, if a flowering plant, all the characteristics peculiar to that plant, while its flower, with all its variations in color, will be shown, the germ having the power to produce its own kind from the varied nutrition afforded it from the union of the life-sustaining forces of the earth and sun within the germ seed and plant cells. Thus the plant preserves the germ element surrounded by a substance capable of being transformed into a temporary supply of nourishment for plant growth by the plant germ in embryo, whenever that union of those vital sustaining forces, through the vital coordination of the sun and earth shall awaken the latent life in embryo, and cause it to respond to the forces uniting within itself to grow and to bear and to put forth all the phenomena peculiar to its kind in plant life. Thus plants receive certain elements from both the earth and the sun, to become stored within the plant and its seed, where those elements may serve as food to enter the blood and become assimilated by the animal cells respectively, according to their respective affinities for the various elements contained within the blood. Through the process of digestion all food elements are dissolved and rendered capable of being assimilated by the animal cell. The liver, more particularly than any other organ, exerts that selective influence by which the nutrition of the food digested and absorbed in the alimentary canal is rendered suitable to be brought into contact with the blood to become a part of the blood and to become suitable material for assimilation by the animal cell. Thus it is that the bile represents not only the refuse from old worn-out red corpuscles and hemoglobin, but a carrier of the refuse to a certain extent of portions of nutrition absorbed through the intestinal digestion and thrown into the portal circulation, but selected through the processes within the cells of the liver as unfit to enter into the blood stream, hence it is thrown into the bile to be returned again to the intestines and possibly thrown off with the excreta, the nutritive portions of the portal contents entering into the formation of new blood through the action of the liver upon such portal contents. Thus the blood stream is replenished with suitable nutrition for the many millions of vital cells within the body. It may be well to observe that the principal portion of the fats eaten are absorbed by the intestinal lacteals and as chyle flow into the receptaculum chyli, and from thence into the blood stream through the thoracic duct, the blood stream being thus replenished through both the liver, via portal circulation, and the thoracic duct via intestinal lymphatics, the glands of which exert a selective influence, permitting only such portions as may be suitable to enter the blood stream to pass through.

As the liver and the thoracic duct become the gateways through which the nutritive products of earthy substances from food eaten enter the body, so the respiratory tract and the skin are the gateways by which the energizing element from the sun enters as an accompaniment of oxygen and becomes an element of the blood to perform its function in the metabolism of the body. The blood thus charged with oxygen, or its asociated vital energy stored within the hemoglobin of the blood and with nutritive elements received through the digestive processes upon the food eaten and thrown into the blood stream via the liver and the thoracic duct, becomes a carrier of vital forces to each germ of life located in each of the many millions of cells located withn the body, the body being a unit composed of millions of individual cells, each performing a function peculiar to its own kind, yet all acting in the aggregate to form a compound unit represented by the body as a whole. The animal cell varies in size from 1-300 to 1-3000 of an inch in diameter. It consists principally of protoplasm, the protoplasm containing a nucleus and an attraction sphere. Cell protoplasm contains a fine network emanating somewhat like tentacles from possibly the nucleus and attraction sphere and called spongioplasm; surrounding this spongioplasm is a more fluid portion called hyaloplasm, which bathes the other portions or more solid consistency. Possibly the hyaloplasm contains much of the nutritive portions absorbed from the blood stream. Thus each vital cell, whether it be epithelial muscle, nerve or connective tissue, of any, or of whatever kind, absorbs nutrition from the blood stream, and from this nutrition it is enabled to perform its functions of whatever kind, and as an aggregate to perform certain functions which, taken with the functions of other cells, form an aggregate of functions that, as a whole, combine to complete the individual living being, enabling it to enjoy and to perform all the varied phenomena of life, peculiar to its kind.

The body contains two distinct nervous systems, yet each connected through communication of nerve fibres and nerve cells. The cerebrospinal nervous system consists of the encephalon or brain and the spinal cord, with the medulated nerves emenating therefrom. The sympathetic nervous system consists of non-medulated nerves and aggregations of nerve cells and fibres in the form of ganglia, also two chains of nerves with their ganglia passing upward in front of the spinal column extending from the ganglion empar in front of the coccyx to the ganglion of Ribes situated on the anterior communicating artery of the brain.

The cerebro-spinal nerves, on emanating from the central nervous system to become distinct nerves, are covered with a nerve sheath called the white substance of Schwann. This sheath is divided at regular intervals into nodes called the nodes of Ranvier, within each node is a distinct nucleus, which appears to exert a nutritive influence over the nerve sheath. The nodes are separated by constrictions in the nerve sheath capable of transversely constricting the nerve. The writer has been impressed that this white substance of Schwann acts as an insulating material to prevent affinities and forces external to the nerve sheath from influencing the force within the nerve current from its true destination to the periphery of the nerve fibre, also that the nuclei of the nodes exert a relaxing influence over the tonicity of the internodes or constricting portions of the nodes of Ranvier, which permit the nerve current to pass without interruption to its destination, the tonicity of the constricting portions at the internodes causing a slight constriction of the nerve at those points, thus normally acting as a stopcock to the passage of the nerve current. The increased stimulation exerted by the mind or any ganglia in directing a nerve current along certain nerve fibres acts as a stimulus to the nuclei of the nodes, causing the longitudinal fibres of the white substance of Schwann to shorten and thus overcome the tonicity of the transverse fibres at the internodes, thus liberating the constrictions along the nerve sheath and permitting the free passage of the nerve current to its peripheral termination, producing the phenomena of voluntary action.

The nerves of the sympathetic system are not so provided with a nerve sheath, as the white substance of Schwann, such nerves act independently of the will. The cerebro-spinal system contains a few such nerves, possibly their action is independent of the will and are engaged more in communication with the sympathetic system in exerting the trophic influence over the cerebro-spinal system than as engaged in producing voluntary action.

It has appeared to the writer that possibly the great sympathetic nervous system acts as a storage battery for the storage of the terrestrial dynamic electrical influence of the body supplied more particularly by the surplus energy as collected by the vital cells and supplied in food eaten and not neutralized by the oxygen of the blood; that this energy becomes as a reserve to supply the deficiency whenever the blood lags or fails in dynamic nutritive qualities in supplying any viscus with sufficient energy to perform its proper function; this energy then must be of such a nature as to unite with the energy breathed and carried within the hemoglobin of the blood, consequently of the earthy kind or influence. This is possibly the reason that the sympathetic nervous system exerts such an influence over the circulation of the blood, the earthy energy passing along the sympathetic nerves within the vascular walls, the energy associated with the oxygen element within the hemoglobin of the blood uniting with this latent energy within the vascular walls, thus producing contractions of vessel walls and thus hastening on the flow of the blood to its various destinations throughout the body.

It is known that when the sympathetic nerve force lags that the circulatory force of the body correspondingly lags; it is also a fact that when the oxygen is not supplied in sufficient quantities, that the circulatory powers correspondingly lag; that when the sympathetic force is strong and the oxygen supply is correspondingly strong with no defect, as in organic disease of the heart or vessels, the circulatory powers are correspondingly strong. It has appeared to the writer that the latent oxygen vital energy within the blood and not required within the cells may be stored within the cerebrospinal system to be used in cases of emergency, to supply any deficiency in oxygen energy. Thus we may have a deficiency of oxygen within the blood, producing a demand for more oxygen from the various cells and vital centers, giving rise to a response from the cerebro-spinal centers or rather, as usually attributed, to the action of the medulla, sending out impulses to certain respiratory muscles, producing increased efforts at breathing to secure more oxygen. The oxygen failing to be supplied in sufficient quantity, the mind is deprived of its energy, lags into stupor followed by unconsciousness and finally death. Possibly the energy stored within the brain becomes consumed in its effort to supply the vital requirements demanded by the millions of vital cells within the body and supplied only by oxygen or rather its associated vital energy, as deprived from the sun's rays. Thus we may have two distinct storage batteries within the body, supplied with energy to be used in cases of emergencies, the one as the sympathetic system, representing the earthy nature and possessing an affinity for the vital energy imparted by the sun's rays, and the other as of the brain and cord, representing the solar element and possessing a supply of energy, having an affinity for the earthy elements in the production of all vital action, produced by the various vital cells of the body. Depending upon the continued mutual action of these forms of energy, we have life within the cell, which, in the absence of this mutual action of the sun's and the earth's affinities, ceases to manifest its vital phenomena, the cessation of which terminates in death of all vital cells, consequently the death of the entire body, the spirit possibly being attracted into the celestial realm by that influence, we shall designate as the life or Divine force governing the invisible life, beyond the knowledge, experience and comprehension of mortal man, and yet truly and silently acting to draw life unto its own, whenever life ceases to be held by those mutual affinities which exist as solar and terrestrial forces, uniting within the cell, which is the material abode of the life or spirit force. Thus whenever the solar and terrestrial forces cease to unite within the cell, the celestial or life force having nothing to hold it to its terrestrial abode, is drawn unto its greater source of life, consequently is drawn from the cell abode, the material manifestation of which we call death. Thus in order for life to be manifested in a material form, there must be a suitable earthy material capable of easy transformation into organized forms, this earthy material acting in a nutritive capacity contains a latent earthy force or energy capable of uniting with the energy imparted to the atmosphere by the solar rays and carried to the cells by means of the hemoglobin of the blood or otherwise, these forces of an earthy and a solar nature uniting within the cell quickeneth the life germ within the cell, enabling it to utilize the heat, force and material thus provided into the varied forms and phenomena of life as manifested in the intricate karyokinesis of the cell.

Thus the cell is enabled to absorb nutritive earthy material from the blood containing an element of force in a latent form, possibly this earthy material becomes centralized around some point representing a magnetized pole of the cell. Another point may have an affinity for the solar energy as contained within the hemoglobin of the blood. This point may act as another magnetic pole, thus the elements of force may be drawn from the blood and uniting within the cell constitute vital force capable of being manifested in the various phenomena of such vital activities as the cell may be able to produce. In vital action, as in the higher forms of life, it may be that certain cells are possessed with a greater affinity for certain force-producing elements, as the neurones of the brain and spinal cord may have the power to absorb and accumulate solar energy, while the cells of the sympathetic nervous system may have a greater capacity and affinity for the earthy elements of force within the blood. Thus the two distinct elements of force may accumulate in different portions of the body, as distinguished by the ganglia of the brain and cord as distinct from those of the sympathetic nervous system. Thus elements of force not required for immediate use within the body may become stored as dynamic energy for future use, to assist cell action in cases of emergencies, when the blood may fail to supply the requisite energy necessary to maintain both vital and voluntary activities.

It has appeared to the writer that such provisions becomes the possible true conditions and means of storing the elements of vital force. It further appears that the union of the solar with the terrestrial forces within the various cells of the body flowing from the dynamic centers as above indicated and uniting within the various cells of the body, or even the cells during the action of any viscus, constitute the vital current, which serves to both maintain the trophic forces and the fulfillment of the function of such part or viscus. Such vital current being produced through the passage from the cerebro-spinal system of the solar electrical influence over the non-medulated nerves connecting the cerebro-spinal with the sympathetic system of nerves, the two currents from the ganglia of each system respectively uniting within the animal cell produce the completion by such electrical union of the vital current within the animal cell. In case of voluntary action the impulse of nerve force is intensified or diminished according to the degree of relaxation of the white substance of Schwann at the nodes of Ranvier, which serve to regulate the degree of nerve flow from the cerebro-spinal system, as the brain and cerebro-spinal nerves and ganglia, to cells of any viscus or part of the body where vital action is required, the cells of such part on the other hand being in connection with the sympathetic system that accompany the blood to the part. The muscle cells also have a capacity to store away the contained energy of the earthy nutritive material as absorbed from the blood, which serves to unite with the solar energy from the cerebro-spinal system flowing in the nerve current released by the relaxation of the nerve constrictions at the nodes of Ranvier, giving rise to muscle contractions in proportion to the force released as the result of this union of forces. Thus muscular contractions are produced, through the union of the solar energy from the brain and cord with the earthy energy within the muscle cells, the solar energy being admitted at the end plates by the sarcostyles of the sarcomers of each muscle fibre respectively, the muscle fiber thus being acted upon through the union of these force elements, causing the sarcostyles to suddenly contract, thus shortening the sarcomers composing each muscle fibre which shorten the entire fibre. The muscle cells and fibres acting collectively over an entire muscle gives rise to muscular contraction of the entire muscle; or the same occurring simultaneously throughout a system of muscles will produce muscular contraction throughout such muscles, relaxation occurring through the checking or stoppage of the nerve current at the nodes of Ranvier upon the nerve sheath, called the White Substance of Schwann, covering voluntary muscles. Thus muscular as well as vital action is produced through the union of the vital current within the cells and fibres of the part in action. Such is the conception of the writer.

CHAPTER XIV.

THE VITAL CURRENT.

To gain a more comprehensive conception of what we mean by the Vital Current, let us conceive of the body being formed of various tissues, which in turn are and have been formed from individual cells and their products, the cells and tissues differing in kind as to their respective natures and each cell and tissue performing a function peculiar to its own kind. The animal cell is of microscopic dimensions, varying in size from 1-3000 to 1-300 of an inch in diameter. Each cell is composed of a peculiar substance called protoplasm and consists of a minute body called the cell nucleus, another minute body called the attraction sphere, a sponge-like substance composed of very minute fibrils called the spongioplasm, and another more fluid substance called the hyaloplasm, which serves to surround the more solid cell elements, as the cell nucleus, the attraction sphere and the spongioplasm, that appear to be suspended and float in the hyaloplasm. Besides material required for nutrition, it is found that oxygen, or rather as we have designated, the vital energy, that associates itself with oxygen, derived from the sun's rays and carried to the cells by the hemoglobin of the blood, is absolutely essential to the vitality of all living cells, in fact is absolutely essential to all vital action as well as all vital action is dependent upon cell activity, which is dependent upon oxygen, or rather its associated vital energy, for the vital force contained within the cell. The vitality of the cell appears to be concentrated more particularly in the cell nucleus. It is found that when the cell is deprived of oxygen, that the cell loses its power of action and the cell wanes and dies, the cell nucleus being first to lose its vitality, followed by the remaining cell elements, all of which soon die when the cell is deprived of oxygen. The multiplication and division of the cell appears to depend upon the attraction sphere. The cell reproducing itself by the division of the attraction sphere, each part takes a portion of each of the remaining cell elements, forming two cells from the one. Thus new cells and tissues are produced to take the place of tissues worn out or broken down and rendered unfit for further use; or for the increase of new tissues required in the growth of the individual. The elements supplying material for growth being derived from the blood; the power to utilize this material being derived through the co-ordinate action of the nervous systems upon the inherent vital force within the cells as taken from the blood, all acting through the guiding influence of the seat of life within the brain as quickened under the influence of the Sensorium. All living cells connect with the seat of life through the sensorium, which in turn is composed of sensory nerves and ganglia.

Living protoplasm within the cells is highly sensitive and responds, producing movements, to certain stimuli. Among these are: temperature not exceeding 104°F.; contact with foreign bodies; mild pressure; dilute salt solution; weak alkalies, and weak currents of electricity. Protoplasmic movements cease from the action of acids, strong alkalies, an atmosphere of hydrogen or carbonic acid and strong currents of electricity. Temperature, if prolonged above 104°F. altogether kills protoplasm, causing it to enter in a coagulated state or heat rigor. The cerebro-spinal nervous system consists of the brain and spinal cord, with their attached cranial and spinal nerves and ganglia. The sympathetic nervous seystem consists of a double gangliated cord, extending from the ganglion Impar in front of the coccyx, upward, anterior to and along each side of the spinal column to the ganglion of Ribes situated upon the anterior communicating artery within the brain, with the attached nerves and ganglia extending to the viscera and the blood vessels.

It appears that where visceral action is most required, that a preponderance of unstriated muscles and sympathetic nerves and ganglia exist; while in striated muscles, where voluntary action predominates, the cerebro-spinal nerves and plexuses predominate.

As already expressed, it is the belief of the writer that each nervous system serves as a dynamic center for the accumulation of nerve force, analogous to the forces existing between the earth and the sun; that the cerebro-spinal nervous system represents a living dynamo, for the accumulation of nerve force peculiar to that of the sun, while the sympathetic nervous system represents a living dynamo for the accumulation of nerve force peculiar to that of the earth; that the blood is the means by which these dynamic centers are replenished, which is done more particularly during perods of inacton, as during rest and sleep; that the hemoglobin of the blood serves as an insulated storage of the vital element from the sun as carried to the lungs by the oxygen of the air breathed to become absorbed by the hemoglobin and held insulated from the earthy elements carried within the fluid portions of the blood and carried to the cells through the forces of the circulatory system, where a sufficient affinity is found in some element of the cells to draw the solar energy from the hemoglobin and thus replenish the solar dynamic force of the cells, the cells alike possessing in some other element an equally strong affinity for the terrestrial dynamic forces within the more fluid portions of the blood, which alike replenishes the terrestrial dynamic force of the cells. By the reinforced energy from each of these two great vital dynamos as represented within the nervous systems respectively, the forces within the cells become sufficiently strong to produce the required vital action necessary to the functionization and peculiar activities of the cells in performing that vital action peculiar to each kind of tissue respectively.

Let us consider the means by which this action takes place. The study of the cerebro-spinal nervous system teaches us that we have two distinct kinds of nerve fibres; the one afferent or sensory, which carries impulses from the peripheral tissues to the brain, while the other is efferent in function and carries impulses from the brain to the peripheral tissues, producing motion, more particularly voluntary motion in striated muscular fibres. Such nerves are insulated with a covering or sheath, called the white substance of Schwann, and consequently are called medulated nerves.

In the spinal nerves, each set of fibres are given off from distinct and separate columns of the cord. After passing through the coverings of the cord, each emerge through the dura-mater, the sensory fibres from the posterior lateral fissure, they then take on a covering and then enter a ganglion, emergng from the ganglion, they unite with the motor fibres which emerge from the anterior lateral column of the cord, they thus intermingle and pass out of the vertebral canal through the intervertebral foramina as mixed nerves. Each nerve now divides into a posterior and an anterior, and a recurrent branch to the vessels of the cord and its coverings, each branch being connected with filaments from the ganglionic sympathetic nerve chain passing upward, along and anterior to the sides of the spinal column. Thus we have the anterior spinal nerves connecting with the sympathetic nerves and the posterior spinal nerves connecting with the sympathetic nerves and the recurrent branch from the conjoined nerves before division, connecting with the sympathetic nerves, while fibres of both the motor and sensory varieties pass to the sympathetic ganglia to mingle with the sympathetic nerves and to pass to the various distribution of blood vessels along with sympathetic nerves and ganglia. Other cerebro-spinal nerve fibres emanating from the cord are distributed to the various muscles of the trunk, while others pass forming plexuses in front of the spinal column in the cervical, the lumbar and the pelvic regions to form nerve plexuses in those regions, while within the thorax the anterior spinal branches of the cerebro-spinal nerves pass along and mingle with the sympathetic nerves, the first six dorsal passing to the pulmonary plexus and thoracic aorta; while the lower six dorsal nerves join with the sympathetic to form the splanchnic nerves to the coeliac axis and to the renal and the suprarenal plexuses.

From each of the plexuses formed within the cavities of the trunk by the spinal nerves can be traced nerve fibres to the parenchyma of the vital organs. In like manner can the branches of the sympathetic nerves and ganglia be traced to the parenchyma of the vital organs. So the nerve supply to all the blood vessels and organs of the vascular system can be traced to both the cerebro-spinal and the sympathetic nervous systems. Thus we have intermingled throughout the body representatives of both the great nervous systems. The sympathetic nerves may not be so plentiful in the voluntary muscles, but nevertheless they are there, if no more than in the distribution of the blood vessels. In the blood supply we find the vascular systems containing upon the vessel walls at short intervals sympathetic ganglia to reinforce and supply the sympathetic nerves distributed within and along the vascular walls. The cerebro-spinal nerves are capable of being greatly reinforced in their action throughout the viscera through the action of the pneumogastric nerves, supplying nerve tone where a deficiency of spinal nerve force exists and possibly in some if not in all instances serving to preserve a visceral equilibrium.

Let us now conceive of the application of these various forces within the body. As already stated, it is the belief of the writer that such forces unite by a chemical or rather an electrical affinity whenever brought into a sufficiently close relation for them to do so. The blood is conveyed through vessels to the capillaries where the cells through an osmotic process draw the contained forces from the blood and store them within the cells, where vital action is produced. Let us endeavor to conceive of how this is done. In order for the blood to be conveyed to the tissues and cells it must be forced there through vessels that themselves require force to propel the blood to its destination. As stated, the blood vessels are well supplied with representative fibres from each of the nervous systems. The heart contains nerve plexuses from each of the nervous systems that serve to reinforce the action of each system within the heart. The heart is supplied with nutritive material through the coronary arteries. The muscle fibres of the heart are supplied with fibres having a cell nucleus in the middle of each fibre. Each nervous system is represented in the cardiac plexuses, which are well distributed throughout the muscles of the heart, the nerve fibres arborizing around each muscle fibre. Each fibre is supplied with both sympathetic and cerebro-spinal nerve fibres, which as we believe are so distributed as to each polarize around the cell. The cell doubtless represents a minute dynamo, containing a positive and a negative pole around which terminal fibres containing the appropriate nerve force are entwined, so that the nerve force represented in each of the two great nervous systems is brought into close proximity. The influx of fresh blood laden with nutrition and vital force fresh from the lungs and coursing the muscular tissues of the heart through the coronary arteries and their capillaries brings the blood into sufficiently close proximity to the cells within each muscular fibre of the heart muscle, so that the elements within the cell at once through the electrical affinity we assume to exist within each cell for each of the electrical forces, at once draw from the blood their required force. The cell nucleus is at once energized and quickened to an acute state of sensibility.

The cell in replenishing itself from the blood becomes charged with sufficient force to leap across the bridge covering the interval separating the two nerve forces contained within the cell from each of the two nervous systems. This causes an electrical union of both nervous systems to take place within the cell. The electrical union causes the cell fibre to contract. The aggregation of similar contractions simultaneously combine to produce muscular contraction. Thus muscular contractions of the heart are produced, which serve to propel the blood into the arteries overcoming the elastic tension of the arterial walls.

The walls of blood vessels are supplied with nerves of both the sympathetic and the cerebro-spinal varieties. Sympathetic ganglia are distributed at short intervals along the arterial walls. The nerves governing the blood vessels are called Vaso-Motor Nerves. The cells of the muscular fibres constituting the blood vessel walls alike are replenished with blood, ladened with vital force, by means of very minute blood vessels called Vasi Vasorum. These cells, becoming charged, unite the accompanying nerve forces from each of the nervous systems, producing similar contractions of the vessel walls as were produced within the heart muscles. The contractions of the arteries thus serve to propel the blood through the arteries into and through the capillaries. The manner in which the muscles of the heart and blood vessels are made to contract, will serve to illustrate the manner in which all involuntary muscles are caused to contract. It will be kept in mind that the sensory nerves from the cerebro-spinal nervous system also arborize around the cells of fibres. Thus the state of the individual fibres and cells throughout the body is made known to the central nervous system, or seat of life, which in turn controls the action of the motor nerves and plexuses throughout the body. Thus if the force from the blood is deficient in any part the central nervous system is made aware of the fact through impulses conveyed over the sensory nerves to the central nervous system, which in turn send out impulses along the appropriate motor fibres to the cells or to the nerve plexuses connected to such cells, which, acting in response to the appropriate stimulus, sends more cerebro-spinal nerve force to the appropriate cells required in supplying the required force. Thus weak places are strengthened by reinforcing the waning nerve action within the cells weakened from lack of sufficient force from the blood. In like manner impressions are conveyed over sensory nerves to motor ganglia of the spinal nerves where impulses are sent out to the approriate muscular fibres and cells along motor nerves, producing what is known as reflex action, without disturbing the attention or arousing consciousness within the mind.

Thus the sensory nerves act as messengers to warn the central vital force of the required needs of any portion of the body. By sensations of well being or pain the central sensorium is able to apprise the mind of the general states of the body. Thus we say we feel well or sick, the mind receiving its information of the bodily states from the central sensorium which serves as a receiving station to receive messages over the sensory nerves from all portions of the body. Thus the seat of life reaches out and through the sensory nerves comes in touch with every living cell and portion of the body, which severally constitute the vital elements in each portion of the body, all combining to form the living individual with all its parts, perfecting the physical being through the sustaining forces from the material earth and the vital sustaining force of the sun and earth as combined with the living germ of life to produce multiplication, growth and all the phenomena of material or physical living beings.

Through the combined action of the nervous systems upon the muscular apparatus of the heart and arteries, the blood is forced into the capillaries and caused to course through the capillaries into the venous system. While within the capillaries the blood does not come in direct contact with the tissues, but the nutritive and vital forces of the blood permeate the thin walls of the capillaries and bathe the tissues, where the tissues receive the vital and nutritive elements from the blood. Thus by an osmotic process the nutrition from the blood passes from the capillaries to become absorbed by the tissue cells. We have endeavored to give our conception of the action of involuntary muscles and the manner in which motion is produced in unstriated muscles fibres. We must now consider another class of tissues, that of epithelial tissues. Epithelial tissues are composed principally of cells with a minimum amount of connective tissue. The cells of epithelial tissue are arranged usually upon a basement membrane, being attached from one extremity to the membrane, the other portion being free from attachment. Thus, instead of being attached like muscle cells, upon all sides to muscular fibres, epithelial cells are attached to a basement membrane, which serves to separate and form a medium of connection between epithelial cells and nerve cells and nerve fibres spread upon the opposite side of this basement membrane from the side containing the epithelial cells. Thus epithelial tissue cells are arranged. This basement membrane may be tubular in form with the secreting cells arranged upon the inner surface of the tube with the elements from the blood contained in the lymph flow and the mechanism of nerve fibres and nerve cells of both varieties spread upon and connecting from the opposite side of the basement membrane from the epithelial cells. The basement membrane, instead of forming tubes which open outward upon the unattached surface of the membrane, may be formed of a simple flat surface, but not usually so, with the secreting cells lying upon the free surface of the basement membrane. Thus, from the nature of their attachment, secreting cells are not so constructed and attached as to produce muscular movement, but rather their movements are confined to the simple expansion and contraction of their coverings and elementary contents. The nervous mechanism within the secreting organs alike connects with the fibres and cells that form the connective tissues, that serve to bind the parenchyma of the organ or part and to hold the various tissues and parts in their appropriate positions within the organ or part. Thus while the vaso-motor system may serve to propel the required blood supply to an organ and through the osmosis peculiar to the nutrition of any part may supply the requisite elements in the lymph thus exuded from the blood, yet the secretory apparatus is dependent upon the coordinate action of both nervous systems that compose the nervous mechanism or cycle formed from both the sympathetic nerves and ganglia and the cerebro-spinal nerve fibres and ganglia, forming plexuses that abound within or upon the viscus or part and by their combined action serve to control the vital action and functionization of the organ or part. Again the blood supply, or rather the exuded lymph containing the nutritive substances and vital elements of the blood to the organ or part with its various cells and structures, serves through the vital stimulation of its presence to awaken the cells and quicken the nucleus of each cell, causing the cells to imbibe and replenish themselves with the nutritive products from the blood as contained within the exuded lymph that serves to bathe their attached portion, the basement membrane. The cells thus become filled with not only material substance from the blood but also with the accompanying solar electro-vital energy imparted by the hemoglobin, which possibly may become concentrated within the cell nucleus, which may serve as the positive pole of this minute cell dynamo, while possibly the attraction sphere may have the innate power to extract the negative electrical force from its terrestrial source, the active principle of food taken within and absorbed within the body and conveyed through the blood to the cells or *vice versa*. Thus the cell dynamos may form and accumulate the respective force contained in each dynamo. By that infinitely acute and delicate organism, the sensory apparatus of our being, the unconscious mind is made aware of the exact state of the nervous organism and forces within the organ and through its attached motor apparatus impulses travel out either from the central seat of life, or from the most appropriate subsidiary motor nerves, possibly stimulated to action from the information conveyed by the stimulus received through a sensory spinal ganglion, to the organ or part, opening the proper degree of nerve force from the cerebro-spinal subsidiary ganglion, releasing the insulation of the white substance of schwann, and permitting the nerve impulses to flow through the medulated nerves, which, coming into sufficiently close proximity to the abounding sympathetic nerve force, produces an electrical union between the sympathetic and cerebro-spinal nerve forces, which serves to stimulate the connective tissue cells and muscle fibres with their controlling muscle cells to such a degree of contraction as may be required to produce such an increase of pressure upon the secreting-cells, which now are brought into sufficiently close proximity to cause an electrical union of their contents, by joining their appropriate electrical poles to the appropriate electrical force reinforced through the respective nervous systems attached to the basement membrane and possibly prolonged within the tissue cells. Thus the nervous systems serve to reinforce the energy within the cells, producing that stimulus required to cause such a degree of contraction of the protoplasm and its contained elements as to cause it to exude the secretion contained and prepared within the mechanism of the cells imparting or rather having the power to extract, those peculiar qualities from the elements of blood contained, that give to each secretion and excretion its peculiar individuality, which serves to enhance the processes of life within the body, performing a function required, yet as a rule indispensable and not capable of being produced by any other part or portion of the body, yet performed and perfectly accomplished by that innate metabolism, infinitely intricate and as equally delicate, beyond and surpassing the grosser comprehension and ingenuity of mortal man, yet known in all its workings in the secret action of the cells of life, by Him who gave the cell its existence and through its delicate action makes life possible to us as individuals, and through the delicate action resulting from all the various and intricate combinations of cell action throughout the body, He gives to us our being, with all its varied functions, processes, activities, possible accomplishments, achievements and ultimate destiny.

Thus the sensory apparatus connects with every living cell and tissue within the body, imparting to the seat of life the general state of each individual part, which in turn through the motor apparatus opens a flood gate of nerve force here, while it closes an excessive flow there, communicating and guaging the flow of cerebro-spinal force through means of the sensory and motor nerves, which find access to the various parts of the body through the cranial and spinal nerves. The apparently insensible union of the cerebro-spinal with the sympathetic nerve force, by which the vital action and movements of the various tissues and cells of the body are produced and maintained, producing a flow of blood to a part and a functionization of the vital tissues of a part, thus maintaining vital heat and vital activity in all parts of the body and nourishing all parts through the flow of blood throughout the body and to any and every part of the body, constitute, through this union within the living cells of the cerebro-spinal with the sympathetic nerve forces, what the writer designates to be the Vital Current of the body, which constitutes the dynamic current necessary to all vital action, deriving its forces from both the terrestrial and the solar vital energies, as absorbed from the blood by their respective nerve dynamos, polarized within the cells and nerve ganglia respectively, where they become guaged and controlled by the unconscious mind within the seat of life, under normal conditions capable of awakening the normal conscious mind whenever and wherever the action of the conscious mind may be sufficiently demanded, the giver and source of all of which is God, ever present, yet incomprehensible.

CHAPTER X V.

THE APPLICATION OF ELECTRO-VITAL FORCE IN PRODUCING THE MOVEMENTS OF THE MOON AND THE INFLUENCE OF THIS FORCE UPON THE EARTH AND MOON THROUGH THE RECIPROCAL RELATION OF THE EARTH, SUN AND MOON.

The earth has one satellite, the moon. The moon revolves around the earth in one lunar month, called a synodical month. The moon makes one revolution in the heavens in what is called a sidereal month, consisting of 27 days, 7 hrs., 43 minutes, 11.5 seconds, or 27.32 days. A sidereal month embraces the time that elapses between the time that the moon leaves a certain position relative to the earth and some fixed star in the heavens until the moon returns again to the same relative position to the earth and the same fixed star.

As the earth, around which the moon is constantly revolving, travels almost one degree in its orbit around the sun each day, therefore the moon, on reaching the same position relative to the earth and some fixed star, will arrive at such position before it has completed an entire revolution around the earth, therefore in making such a circuit, denominated a sidereal month, the moon does not complete an entire circuit of the earth. The moon must also cover the space covered by the earth in its orbit during such revolution and overtake the earth to gain the same position relative to the earth and the sun, which requires an additional extension of time of over two days, making what is called a synodical month, in 29 days, 12 hrs., 44 minutes, 2.8 seconds, or 29.53 days.

The moon's orbit is inclined to the ecliptic at an angle of 5°8′48″. The moon crosses the plane of the ecliptic at two opposite points in its orbit. Those points are called the moon's nodes. As the moon intervenes between the sun and the earth at the times of her new moon and lies beyond the side of the earth remote from the sun at the periods of her full moon, it is evident that she must cross the plane of the ecliptic in her orbit at the time of her first quarter and again at the time of her third quarter. Thus the nodes are situated at the points where the moon crosses the ecliptic. The first node called the ascending node marks the passage of the moon over the ecliptic while the moon is waxing, which occurs at the end of her first quarter; while the second node, called the descending node, marks the passage of the moon over the ecliptic while the moon is waning, which occurs at the end of her third quarter. Thus the plane of the moon's orbit falls wholly within the tropics of the earth. (Note carefully Plate XI.)

We will now endeavor to unfold our conception of the application of this universal electro-vital force in the production of the movements of the moon around the earth. (Note closely Plate XII.)

The moon is acted upon by both the earth and sun and both of these bodies either attract or repel the moon, acting according to the preponderance of either the negative or positive state of the moon's surface and that of the sun and earth for such electrical states of the moon. It is the resultant of this attraction and repulsion upon the moon's mass that causes the moon to glide around the earth.

The reader is referred to the description previously given (See Plate IV.) of the cause for the earth's rotation on its axis. It will be noted as the earth passes under the zenith line or possibly a few degrees on either side of the zenith line, more particularly to the east of the zenith line, the earth's surface becomes changed from a negative state to a positive state; that, while such change takes place on the surface of the earth facing the sun, a change is likewise taking place on the side of the earth directly opposite from such surface, that while the side of the earth facing the sun is being changed to a positive state the opposite side directly opposite from the sun is being changed to a negative state. (It is assumed that the electrical flow will travel in the direction of least resistance, and, as all intermolecutor space is alike acted upon and filled with this universal electro-vital force, that the flow will take a direction directly leading from the electrified body emitting such electrical flow, consequently, as the entire earth is alike subjected to such electrical force, the flow will be along straight lines directly from the highly charged electrified body, the sun, and pass through the earth along direct lines leading from the sun).

For the sake of clearness in conception, we will divide the positions of the earth, relative to the sun and the earth's axis, into four quadrants, by lines running longitudinally and corresponding to the medium lines passing over the earth's surface and connecting the poles of the earth. (See Plates IV and XII.) Such a line is the zenith line that marks the period of noonday. We will begin with the meridian line that passes over the earth's surface 90° to the west of the zenith line and designate such portion of the earth's surface as may be contained between 90° to the west of the zenith line and the zenith line and marking the time dur-

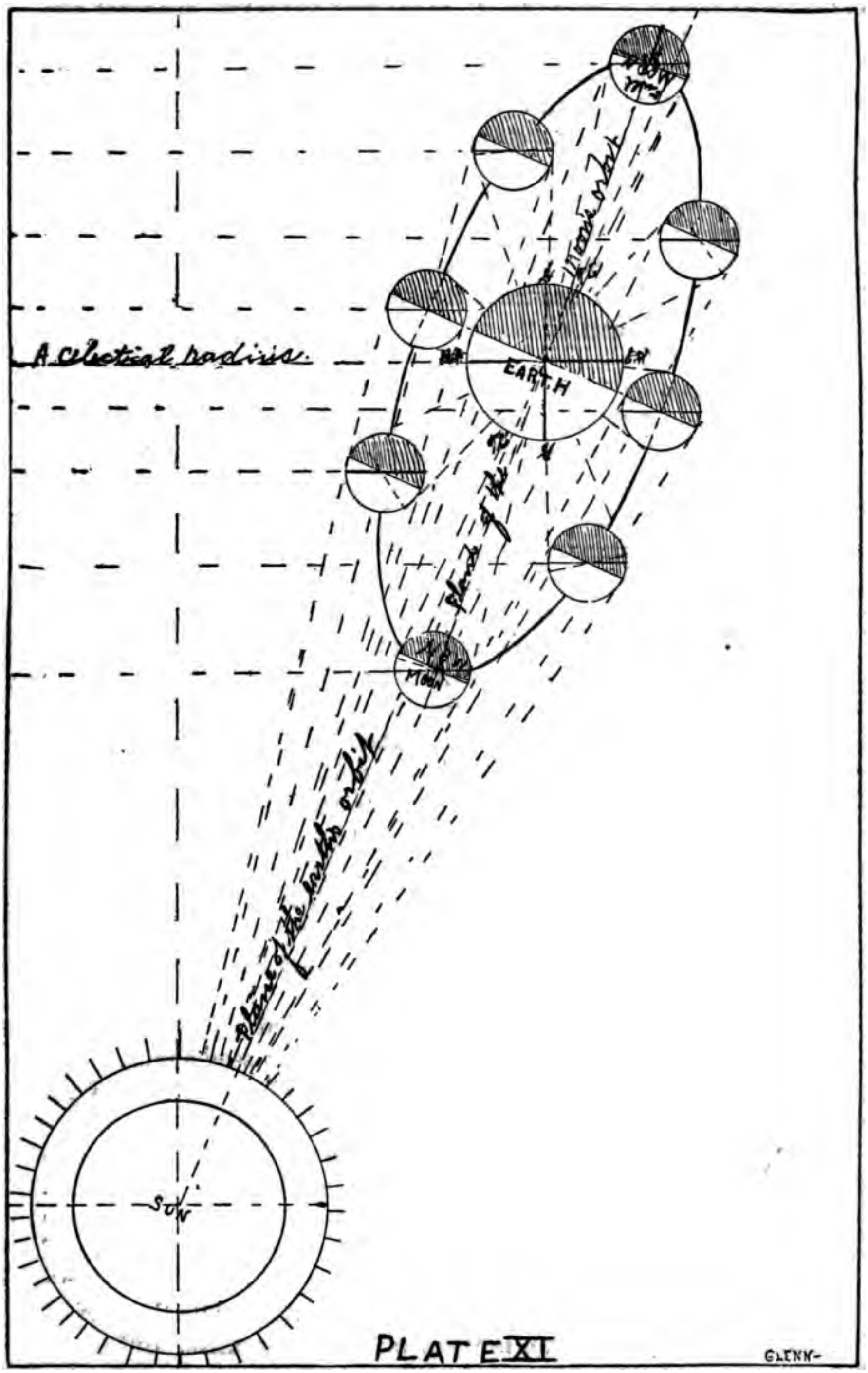

A celestial radius.
Moons orbit
plane of the
EARTH
MOON
plane of the earths orbit
SUN
GLENN-

PLATE XI

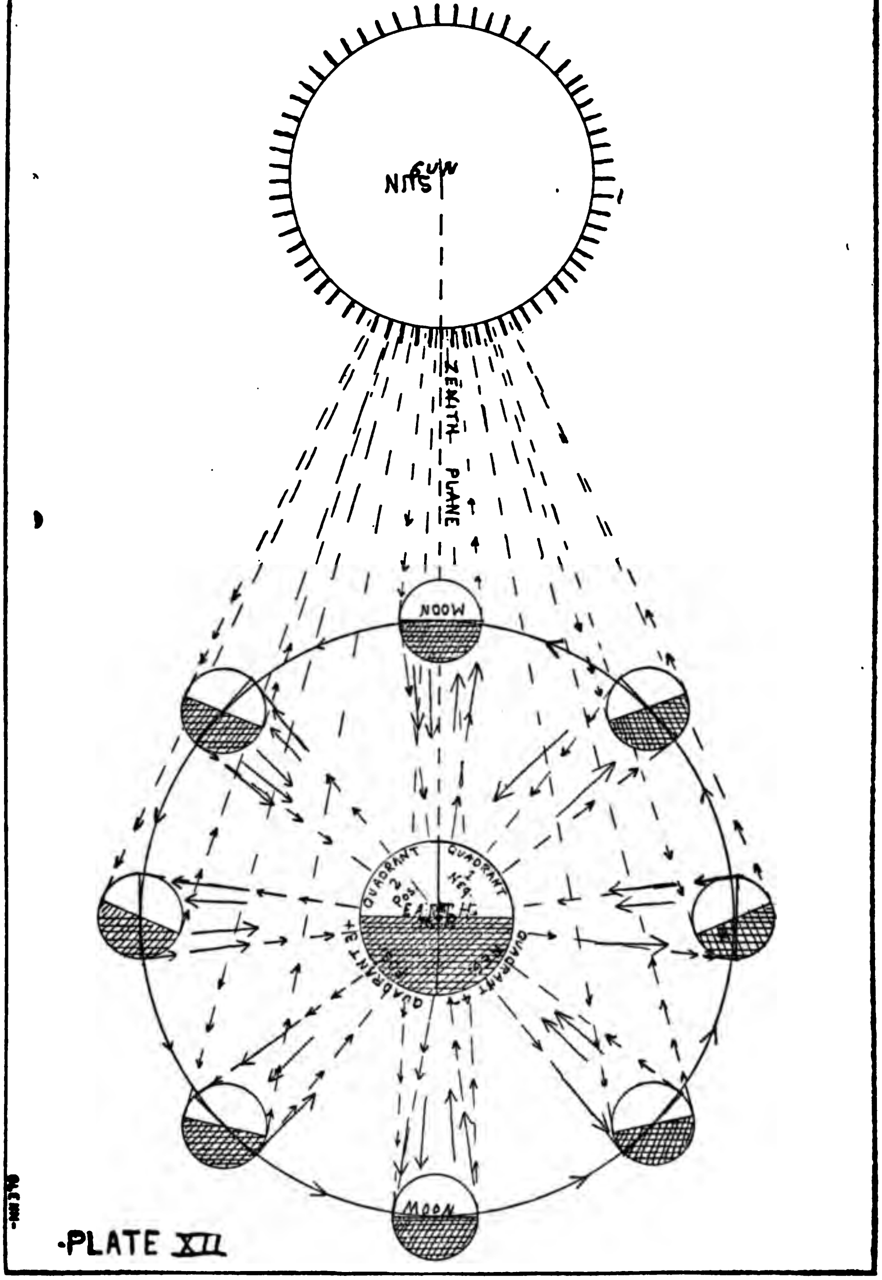
ing the hours from 6 A. M. to 12 M., as the first quadrant; quadrant two will include all that portion of the earth's surface included between the zenith line and 90° to the east of the zenith line and marking the time from 12 M. to 6 P. M.; quadrant three as including all that portion of the earth's surface included between the meridians marking 90° to the east of the zenith line which marks the eastern limit of quadrant two and 180° east or west of the zenith line and marking the hours from 6 P. M. to midnight; quadrant four as all that portion of the earth's surface included between 180° to the east or west of the zenith line, which marks the eastern line of quadrant three, and the western line of quadrant one, 270° to the east of the zenith line and 90° to the west of the zenith line.

It will be seen by inspection that quadrants one and four are electrically negative and that quadrants two and three are electrically positive. We will also observe that while the solar rays may be changing the earth's surface from negative to positive that the electrical antipode lying on the opposite of the earth is being changed from positive to negative and that in this manner the earth is at all times supplying to the solar exposure an electrically negative surface.

The hemisphere of the earth containing quadrants four and one thus becomes electrically negative, consequently is drawn toward the sun, while the hemisphere of the earth lying to the east of the zenith plane and containing quadrants two and three is electrically positive and consequently is repelled from the sun. Thus the earth is kept constantly rotating on its axis. It will also be remembered that, in the chapter explaining the annual revolution of the earth around the sun, it was shown that the hemispheres of the earth, as divided by the equator, are alternately changed from positive to negative, as the earth is revolved in a position, to change the illumination of the earth's surface relative to the area around each pole for a distance of 23°27′40″. While the electrical state of such hemisphere is being changed, the other hemisphere is being likewise changed to an opposite electrical state.

We will keep in mind these electrical changes of the earth relative to its several quadrants daily and to its hemispheres semi-annually and apply these states in their natural relation to the electrical state of the moon, as effected electrically by the solar rays.

It is not known if the moon revolves on its axis. Scientists have concluded that it does not, and that it keeps the same side turned toward the earth at all times while it thus changes constantly relative to the surface of the sun, making an entire revolution each lunar month of 29.53 days. This long exposure to the sun's rays inclines the moon's surface facing the sun to become very much positive, while the surface of the moon not facing the sun becomes very much negative. But as the


SUN
ZENITH PLANE
MOON
QUADRANT 1 Neg.
QUADRANT 2 Pos.
EARTH
QUADRANT 3
QUADRANT 4
MOON

·PLATE XII

surface of the moon is constantly changing relative to the surface of the sun, making some 12°11′27″ each terrestrial day of 24 hrs. duration, it becomes evident that the surface of the moon is making a constant like electrical change relative to its surface. As the mass of the moon is comparatively small as compared to the mass of the earth, it being only 1-80 of the mass of the earth, and only 2160 miles in diameter, and if the moon has an atmosphere, which is altogether probable, and if heat is generated according to the writer's belief, not by the sun itself but by the union of the electrical currents between two bodies having an electrical affinity for each other, then the heat of the moon need not be very intense, while the solar vital state of its atmosphere may be relatively strong, yet the surface of the moon being long subjected to the constant rays of the sun, will incline to increase the intensity of the surface heat of the moon, yet this heat will be subjected to modification by the prevailing currents of its atmosphere, providing the moon has an atmosphere, which is altogether probable.

As the moon inclines to keep the same surface inclined to the earth, we are led to believe that the moon must be more dense on the side of the moon facing the earth, and as the moon is alike influenced by the celestial pull or attraction we must conclude that the moon contains its greatest density in that portion facing the earth and turned nearest to the celestial center, consequently its northern hemisphere on the side facing the earth must contain its mass of greatest density.

Holding these conditions in mind we will, before passing, consider the position of the moon relative to the earth, that we may the better comprehend the application of the forces acting upon its mass and the possible influence of the moon upon the earth. We are at present considering the moon in the position of full moon and the earth at the period of its summer solstice, or aphelion. The moon lies at an angle with the ecliptic of 5°8′48″, if north of the ecliptic, making an angle with the equator of 18°18′52″. If a plane were passed through the equator perpendicular to the earth's axis and extended outward for a distance of 240,000 miles from the earth, the moon would lie south of this plane for a distance of some 77,879 miles. Thus it will be seen that the moon will lie at this period over 73,000 miles south of the south pole and at a distance from the earth of some 240,000 miles. It will be seen how beneficial this position is to the now unilluminated south pole of the earth, both in reflecting the light of the sun from the moon and by so doing both illuminate from the moon the unilluminated area and cause the solar positive electrical force reflected from the moon to unite with the negative electrical force existing within the area unilluminated from the sun's rays that surrounds the unilluminated south pole at this time. Such electrical union will undoubtedly result in a small amount of heat being generated upon the earth's surface that will add its influence to mitigate the severity of the frigid polar atmosphere. Thus the full moon will serve to add both light and a small portion of heat to the unilluminated area surrounding the south pole at this time.

As the field of vision upon the face of the moon at this time is now illuminated by the sun and consequently is electrically positive, there will be an electrical attraction between the full moon and the unilluminated electrically negative pole of the earth, consequently the moon will be attracted by the following forces, the unilluminated negative area surrounding the south pole at this time, the electrically negative fourth quadrant of the earth and the attractive force of the sun for the advancing negative border of the moon.

We shall endeavor to unfold the manner in which these forces are subject to change due to the change in the electrical states of the moon and earth with that of the sun, resulting in a combined force causing the moon to revolve in its orbit around the earth.

Referring to plates XI and XII, let us carefully consider the electrical state of the moon and the quadrants of the earth facing the moon in this position. The moon is traveling to the eastward around the earth, making an entire revolution in a synodical month of 29.53 days. The moon will appear to rise later each evening by about 48 minutes and 44 seconds. As the general direction of travel is eastward, we will speak of the moon as having an eastward and a westward border, that is, the side of the moon that appears most eastward to an observer upon the earth we will consider as its eastward border, while the side of the moon so appearing as the westward border we will speak of being its westward border. As the moon travels once around the earth in 29.53 days and keeps the same side toward the earth it is evident that its surface must change with respect to the sun's illumination and that during the same period the sun's illumination must travel once around the moon, therefore the moon's surface changes with respect to the sun's illumination 1-29.53 of 360°, or a change of 12°11′27″ each day of 24 hours each. This being the case it is evident that the eastward border of the moon is experiencing a sunrise while the westward border of the moon is experiencing a sunset and that each 24 hrs. the line or meridian marking the previous sunrise 24 hrs. before must be 12°11′27″ above the horizon, on the line of the sunrise, while the line of sunset the 24 hrs. previous must have passed below the horizon a distance of 12°11′27″; therefore the eastward side of the moon for a short distance will be electrically negative, consequently will be drawn toward the sun, while the westward border of the moon being so long exposed to the sun's rays will be electrically positive, consequently will be repelled by the sun. It is evident that all of the illuminated side of the moon save a narrow margin along its eastward border is electrically positive, consequently the pushing force of the sun upon the moon will be greatly in preponderance over its drawing force for the negative eastward border. But an obesrver upon the third quadrant of the earth along the equator, will be about 6000 miles to the westward of an observer upon the earth's equator similarly situated upon the fourth quadrant of the earth. The electrical state of the third quadrant of the earth is positive while the fourth quadrant is negative, consequently the positive surface of the moon will be driven farther forward in its advance around the earth by the positive state of the third quadrant while the surface of the moon will be drawn upon and the moon caused to advance by the negative state of the fourth quadrant of the earth. As the drawing force is exerted some 6000 miles in advance to the eastward of the pushing force it will be readily seen that the tendency is to exert a propelling force upon the moon to the eastward, while the drawing force exerted by the sun upon the eastward negative advancing border and by the third quadrant of the earth upon the negative positive surface of the moon will combine to draw the eastward border of the moon toward both the sun and earth, thus guiding the moon by its advancing border into a circular orbit around the earth, while traversing the third quarter of the moon's orbit. Thus the moon is acted upon by both the sun and earth while passing from its full moon to the end of its third quarter where it reaches its descending node.

At the position of the full moon the illuminated portion of the moon is turned in a position facing the earth, consequently the hemisphere facing the earth is seen as fully illuminated. In order for the reader to the better comprehend the changes that take place upon the moon's surface while rotating through its third quarter from its full moon to its descending node, let lines be drawn as follows: To include the surface of the moon exposed to the sun's rays, let a line connect the centers of the sun and moon at all times while the moon is rotating in its orbit; through the center of the moon let another line be rotated perpendicular to the line connecting the centers of both moon and sun and terminate or cut the surface of the moon. It is evident that this line will determine the line of illumination by the sun's rays upon the moon's surface. It is further evident that this line of illumination must at all times change upon the moon's surface during the moon's rotation around the earth. To determine the influence of the earth upon the moon and compare its infiuence with that of the sun, let another line fall from the moon's center to the center of the earth, now let another line pass and be rotated through the moon's center perpendicular to the line passing from the moon to the earth. It is evident that this perpendicular will outline the limit of the portion of the moon facing the earth, which will determine the field of vision, when vision is possible, of a spectator upon the earth viewing the moon's surface, also that this surface will determine the area upon the moon of the earth's influence over that of the moon. It is further evident that this area of the earth's influence must change relatively with that of the field of illumination from the sun's rays as the moon rotates around the earth. These respective areas must be kept in mind while determining the influence of the sun and earth respectively upon the moon. As the moon passes from the position of its full, it will be seen how the field of the sun's illumination and the field of the earth's influence upon the moon will change upon the surface of the moon. As the moon at all times keeps the same side turned toward the earth, possibly due to its specific gravity, the moon being heavier on the side facing the earth as already indicated, it will be seen that the lines passing from the center of the moon to the center of the earth will not change upon the moon's surface, consequently the line cut by a perpendicular rotating upon this line through the center of the moon will not change upon the moon's surface, consequently the area of the earth's influence upon the moon's surface and the field of vision to a spectator upon the earth will not change upon the moon's surface, the identical surface being held toward the earth at all times. Yet the surface of the moon will change both as to illumination and electrically as it changes its position relative to the sun, consequently will change in its electrical effect upon the earth, as it rotates from the position of over one of the earth's quadrants to over another quadrant. It will be seen that as the moon rotates from the position of its full moon into its third quarter it will rotate into a new position wherein the eastern line of the sun's illumination will pass beyond the line of vision to the spectator upon the earth, while the western line of illumination will pass eastward upon the moon's surface within the field of vision, consequently the moon will cease to appear as being full, but a dark shade will appear over the western border of the field of vision and constantly enlarge as the moon rotates eastward, causing the westward line of the illumination to pass farther eastward upon the field of vision, which it does at the rate of 12°11′27″ per day of 24 hrs. duration.

The moon now rotates into a position over the electrically negative fourth quadrant of the earth, while the line of illumination now gradually passes from the field of vision, consequently the western border of the illuminated surface is being constantly passed to the eastward, leaving the previously illuminated surface without the influence of the sun's rays which after a short time become electrically changed from a positive to an electrically negative state; consequently as the moon swings from the influence of the electrically positive third quadrant of the earth to under the influence of the electrically negative fourth quadrant of the earth, the remaining illuminated border of the moon under the positive influence of the sun will be attracted by the negative fourth quadrant of the earth while the western border of the illuminated surface of the moon will be repelled by the negative influence of the fourth quadrant of the earth. It will be seen as the moon swings sufficiently near the electrically negative first quadrant of the earth, that the moon will continue to be drawn along its remaining illuminated positive border by the negative first quadrant of the earth, while the electrically negative fourth quadrant of the earth will still repel the negative unilluminated surface. As the mean distance along the earth's equator between homologous portions of each quadrant is some 6000 miles, it will be seen how the first quadrant will continue the drawing force upon the moon exerted some 6000 miles in advance of the repelling force exerted upon the moon by the fourth quadrant of the earth, these forces so combining as to cause the moon to continue through its orbit over and around the earth. Thus the moon, while passing through its third quarter, changes electrically in such a manner as to correspond to the change in position and consequent change in the electrical states of the quadrants of the earth over which the moon is passing, so that the propelling and drawing forces continue to act upon the moon's mass in a manner to propel the moon forward in its orbit around the earth. As has been said the entire illuminated surface of the moon will not be seen by an observer upon the earth, while the moon is passing from the position of the full moon to the descending node at the end of its third quarter, from the fact that the eastern line of illumination is constantly passing beyond the eastern border of observation from the earth, which is due to the change of position in the moon relative to both the earth and the sun. It will be seen that an angle formed by lines drawn from the moon to both the sun and the earth will gradually increase as the moon moves forward in its orbit around the earth, which fact is due to the line of illumination that constantly passes eastward upon the surface of the moon, which carries a constantly increasing portion of the illuminated surface beyond observation from the earth, while the western line of illumination likewise falls eastward from the western line of observation. We have shown that the mass of the moon along the eastern line of illumination is electrically negative and is consequently drawn by the electrically negative force of the sun, while the remaining portion of the illuminated surface lying to the westward of the advancing negative border is electrically positive and consequently repelled by the sun's force. We have also shown that the electrically positive surface of the moon is also attracted to the earth by the electrically negative fourth and first quadrants of the earth, while the unilluminated surface of the moon shown to the westward side of *the field* of illumination is at first for a short distance electrically positive and consequently repelled by the electrically positive third quadrant of the earth.

As the moon continues to travel farther from the position of full moon and approaches the position of its descending node and the westward side of the field of vision falls without the illuminated portion and becomes gradually changed to a negative electrical state, this new unilluminated electrically negative surface becomes acted upon and repelled by the electrically negative fourth quadrant of the earth, while such portion of the electrically positive illuminated surface of the moon as may lie within the field of vision becomes drawn by the electrically negative first quadrant of the earth, over which the moon is now approaching. Thus we find the same application of the repellent and attractive electrical forces of the earth for the electrical states of the moon continuing, which still cause the moon to be repelled along its westward border and attracted to the earth along its eastward border. By closely scrutinizing the various combinations of forces it will be seen how the moon is both drawn and pushed over and around the earth.

Thus by combining the force of the sun with that of the earth upon the moon the result is a gentle tilting of the moon toward the earth along its forward border to a line passing between the sun and earth while a repulsion of both sun and earth against its posterior or western border tends to further increase the tilting movement of the moon to the earth, thus further drawing the line of motion more directly away from the sun and inclining the same to approaching the earth, the tendency of which is to produce and preserve a circular orbit for the moon around the earth, while passing through its third quarter. As the moon leaves its descending node and passes into its fourth quarter it begins to swing into a position between the earth and the sun. The preponderance of the sun's force is to repel the moon and inclines to drive the moon nearer the earth and away from the sun more and more each day as the moon swings nearer its position of new moon. The moon would be driven into the earth at new moon, were it not for the fact that the unilluminated surface of the moon is more and more each day increased in the field of observation and consequently the negative force of the moon is more and more each day acted upon by the negative force existing in the fourth and first quadrants of the earth, which increases day by day the repellent force of the earth against the moon to oppose the repellent force of the sun against the moon at this time. Thus in a general way the negative force of the earth exerted against the negative force of the moon's unilluminated area serves to counterbalance the positive repellent force of the sun exerted against the positive force of the moon's illuminated area facing the sun.

Thus as the moon swings in its orbit between the earth and sun the negative area of the moon grows stronger as the unilluminated area grows larger while the moon swings over a negative area of the earth, which combines as a repelling force against the moon to overcome the repelling force of the sun for the moon, thus preventing the moon from swinging into the earth as it swings in its orbit, propelled, by the forces already enumerated, to its position of new moon between the earth and sun.

The moon has now arrived at the position of new moon, which is 5°8′48″ south of the ecliptic and 18°18′52″ north of a plane perpendicular to the earth's axis passing through the equator of the earth and extending for a distance of 240,000 miles from the earth at the period of the earth's aphelion. The moon now lies north of this plane a distance of over 77,000 miles and still north of the north pole some 73,000 miles and at a distance from the earth of some 240,000 miles. It will be seen that the new moon will now be in a position to draw a positive electrical force from the positive area of constant illumination surrounding the north pole, which will incline to lessen the positive state of such constantly illuminated area of the earth to a small degree, which will serve to add to the surface heat of the moon lying within the field of vision. As the earth is some 80 times greater in mass and consequently greater in diameter than the moon, it will be seen that the effect must be correspondingly greater upon the moon's surface than the effect of the full moon upon the earth's surface, yet it will be seen that the moon is not drawing from the entire surface or mass of the earth, neither is the entire effect of the earth upon the moon extended over the entire surface of the moon. Doubtless the earth serves to illuminate the field of vision upon the moon, adding its influence to both plant and animal life if any, and further to the comfort and convenience of such inhabitants, if any, as may dwell upon the moon. It is evident that the new moon, now electrically negative, will be atracted by the electrically positive area surrounding the constantly illuminated pole of the earth. The new moon will be drawn upon by the electrically positive illuminated area surrounding the illuminated pole and by the electrically positive second quadrant of the earth and be pushed by the positive influence of the sun upon the moon's solar illuminated area combined with the electrically negative state of the first quadrant of the earth upon the westward negative surface of the moon.

It will be observed that the new moon lies beyond and over the illuminated pole of the earth and is attracted to the earth by the positive state of the illuminated area surrounding the illuminated pole of the earth, while during periods of the full moon, the moon lies beyond and over the unilluminated pole of the earth and is attracted to the earth by the electrically negative state of the unilluminated area surrounding the unilluminated pole of the earth. The union of the moon's positive electricity with the earth's negative electricity surrounding the unilluminated pole, serves to reduce the normal affinity of the earth for the electro-vital force surrounding the sun.

The position of the new moon throws the unilluminated electrically negative surface of the moon toward the earth, which as to position is in line with the zenith and consequently in a plane passing between the first and second quadrants of the earth. The electrically negative first quadrant of the earth lies to the westward of a plane connecting the sun, moon and earth while the electrically positive second quadrant of the earth lies to the eastward of such a plane. The now exposed negative surface of the moon will be repelled by the electrically negative first quadrant of the earth along the moon's western border and will be drawn to the eastward along its eastern border by the electrically positive second quadrant of the earth and the positive area surrounding the illuminated pole, which, combined with the repelling force of the sun, exerts a combined force to propel the moon from the sun in the direction of the earth, the repelling force of the first quadrant of the earth tending to prevent the moon from approaching too near the earth, all forces combining in a resultant which carries the moon over and around the earth after leaving the position of new moon.

Thus the various forces combine to carry the moon through its first quarter to the ascending node, where the orbit of the moon crosses the plane of the ecliptic at the end of the first quarter after new moon.

The illuminated surface of the moon steadily grows larger, while the unilluminated surface of the moon, within the field of vision, as steadily grows smaller, after the moon leaves the position of new moon, until at the end of the first quarter of the moon the field of vision has become about equally divided between its illuminated and its unilluminated surfaces.

The illuminated surface within the field of vision continues to grow larger while the unilluminated surface continues to grow smaller, all the while the moon is passing through its first quarter. The moon on arriving at the end of its first quarter and at the beginning of its second quarter, arrives at a position over the earth's surface between the second and third quadrants of the earth. The western half of the field of vision will now be illuminated and electrically positive, while the eastern half of the field of vision will be unilluminated and electrically negative. The electrically positive surface of the field of vision will now be repelled and pushed by both the sun's force and the electrically positive second quadrant of the earth, while the electrically negative surface of the field of vision will be pulled by the electrically positive third quadrant of the earth. Thus the moon will continue onward over and around the earth while passing through its second quarter. While the moon is passing through its second quarter the illuminated surface of the moon is waxing and all the while the unilluminated surface of the moon is waning, until by the time the moon reaches the position of full moon, the unilluminated surface has disappeared from the field of vision and the illuminated surface has covered the field of vision. The moon now faces the earth and sun, showing its entire face as illuminated. It will be seen as the illuminated surface is increased and the unilluminated surface decreased within the field of vision upon the moon's surface, that the positive area likewise increases while the negative area likewise decreases. If the conditions remained electrically the same all the while upon the earth under the moon, the positive surface of the earth would now more and more repel the moon, which, combining with the repellent force of the sun, would send the moon into space hurling from both sun and earth; but while the surface of the moon within the field of vision was becoming more and more illuminated and the more and more positive, the moon was moving into a position over the earth where the eastern portion of the electrically positive third quadrant of the earth would continue to draw upon the remaining portion of the electrically negative unilluminated surface, while the western portion of the electrically positive illuminated surface of the moon would be repelled by the electrically positive third quadrant of the earth, assisted by the repelling force exerted by the sun upon such surface of the moon. This condition would continue until the moon would float into a position where the field of vision upon the moon would about reach entire illumination and the field of vision upon the moon's surface would become practically entirely electrically positive, but as the surface of the moon becomes more and more positive the moon is floating into a position where it becomes influenced by the electrically negative fourth quadrant of the earth, which has an attractive force for the electrically positive illuminated surface of the moon. Thus as the moon floats into the position of full moon the electrically positive third quadrant of the earth continues to repel the moon and cause it to be pushed onward in its eastward course, while the electrically negative fourth quadrant of the earth sets in to draw upon the electrically positive illuminated surface of the moon, which now at the position of full moon practically covers the entire field of vision. Thus the various forces combine to maintain a propelling force exerted upon the moon to cause it to continue its course around and over the earth, while the drawing force exerted upon the moon by the fourth quadrant of the earth causes the moon to be drawn in a course encircling the earth, by resisting the centrifugal force, or momentum of the moon. Thus the moon is caused to encircle the earth influenced by the electrical combinations that all the while are being formed, utilized, changed and reformed between the moon, earth and sun.

THE INFLUENCE OF THE MOON UPON THE PRODUCTION OF HEAT UPON THE EARTH AND UPON THE VITAL STATES OF THE EARTH'S ATMOSPHERE.

We will first consider the influence of the full moon, before giving the influence o fthe new moon, upon the earth and its atmosphere. The reader will bear in mind that the influence of the moon upon the earth and *vice versa,* during any period in its orbit may be obtained by similar reasoning, always taking into consideration the positive or negative electrical states of the moon and earth and reasoning from cause to effect.

If one will carefully consider those conditions, they may consider the moon in any position and determine its existing relation to the earth. While the moon is at and near its full, the illuminated surface and the field of vision are practically the same. During such time the solar influence upon the illuminated surface of the moon will render the field of vision electrically positive. This electrically positive state of the field of vision will possess an affinity for the electrically negative fourth quadrant of the earth and cause an electrical flow to swing from the positive surface of the moon and become exerted upon the earth to satisfy the unsatisfied affinity existing upon the earth, or as nearly satisfy such affinity as lies within the power of the limited solar electrical supply upon the moon's surface to do so. Thus the electrically positive solar influence from the moon will be transmitted to the earth and unite with the electrically negative fourth quadrant of the earth, during the hours from 12 P. M. to 6 A. M. to generate a small amount of heat upon the earth's surface as the fourth quadrant of the earth swings under the full moon, and in so doing reduce the normal affinity of the earth's mass for solar electricity.

This small amount of heat becomes a factor in diminishing the effect of frost and cold that may have accumulated upon the earth's surface while such surface was swinging through the position of the earth's third quadrant, from 6 P. M. to 12 P. M. Thus frosts during full moon are less destructive to vegetation than those that occur during periods of new moon. It is evident that such generation of heat, during periods in which no frosts occur or while vegetation is growing, will give a stimulus to vegetation that will add to the rapidity of its growth, especially after midnight during periods of full moon. During such season the atmosphere is already warmed during the day and has but the short period between 6 P. M. and 12 P. M. in which to cool by radiation, which will give the minimum of heat radiation during the night.

Thus during the period including the latter portion of the second quarter of the moon and during the period of the full moon and the first portion of the third quarter of the moon, the earth radiates less heat and remains warmer during the night, with a consequent stimulus to vegetation that must make a better and more rapid growth than during the periods when the moon does not transmit the solar influence from the sun to the earth, as during periods of new moon. Thus the full moon becomes a potent factor in preventing the radiation of heat during the latter portion of the night and during such time by generating a small portion of heat becomes of great effect in producing a more rapid growth and development of all vegetation during such periods.

It is evident that the transmission of the solar electrical influence from the illuminated surface of the moon during periods of full moon and the same uniting with the terrestrial electrical flow from the negative fourth quadrant of the earth will to a certain extent diminish the negative terrestrial electrical state upon such fourth quadrant of the earth and the unilluminated surface around the unilluminated poles, consequently the fourth quadrant of the earth will rotate into the position of the first quadrant and under the influence of the sun's rays with a diminished negative electrical state, to the amount of such diminution from the moon's influence. Such diminution in the terrestrial electrical force will leave a less degree of force to unite with the solar electrical flow during the day and consequently require a less degree of solar electricity to neutralize the remaining terrestrial electricity, which will leave a greater degree of residual solar electricity within the atmosphere. The diminution of the terrestrial electricity during the night has the effect, first, to diminish the amount of heat from solar electrical union during the following day and consequently modifies the extreme heat during the day. It likewise modifies the extreme coolness of the nights, yet does not diminish the total production of heat during the 24 hours; second, the transmission of the solar influence from the moon uniting with the terrestrial electricity during the night, has its influence in requiring a less degree of solar electricity to neutralize the remaining terrestrial electricity during the following day, which leaves a greater degree of residual solar electricity within the atmosphere, hence makes the atmosphere more vitalizing during such periods.

Thus the full moon serves to modify the coolness of the nights and mitigates the effect of frosts during such periods; it also serves to illuminate and modify the cold upon the solar unilluminated surface of the solar unilluminated pole of the earth. This it does by the solar positive electro-vital force being reflected from the moon to the negative terrestrial electrical force surrounding the solar unilluminated pole of the earth and in so doing uniting with such terrestrial force to produce a certain degree of heat at the points of such union and in so doing mitigating the cold within such unilluminated region. In so doing the negative terrestrial electrical force within such unilluminated area surrounding the unilluminated pole is diminished to a certain degree, which serves in a like degree to diminish the normal terrestrial affinity within the earth for the electro-vital force surrounding the sun. Thus the influence of the full moon serves to reduce the normal affinity of the earth for the electro-vital force of the sun, giving to the earth a less degree of affinity than that degree proportional to its mass.

During the period of new moon, the moon lies between the earth and the sun with the electrically negative surface of the moon lying within the field of vision to the observer upon the earth. The position of the moon lies over and along the zenith line and between the elctrically negative first quadrant of the earth and the electrically positive surface of the second quadrant of the earth. Consequently the moon will be drawn forward by the electrically positive second quadrant of the earth acting upon the electrically negative surface of the moon, while the moon will be pushed onward by the electrically negative first quadrant of the earth acting against the electrically negative surface of the moon. The electrically positive state of the constantly illuminated surface surrounding the illuminated pole will find an affinity in the electrically negative surface of the moon now facing the earth, which will result in the moon being further drawn onward by the more electrically intensified body, the positive surface of the earth.

During the period of the new moon the electrical state of the earth upon its unilluminated side is not diminished during the night by electrical union with the moon, consequently the earth rotates under the moon with its full electrical force, which secures a greater potentiality in the electrically negative terrestrial force and leaves it to combine with greater avidity with the electrically positive solar force, resulting in a greater production of heat and in a greater diminution of solar vital energy during the day. But as the solar force unites with the terrestrial force and neutralizes to produce a positive surface upon the earth, this positive state is drawn at once, to the degree of the moon's influence upon the earth. This upward flow of electricity will cause a decrease in electrical pressure between the earth and the moon and a consequent lessening of intermolecular tension within the atmosphere over the positive surface of the earth, which will induce the inflow of atmosphere from regions over which such tension is not so much reduced, which will cause the atmosphere to rise suddenly over such positive areas of the earth in electrical communication with the moon. This inflow of air from regions north in the northern hemisphere and from regions south in the southern hemisphere will bring an influx of cooler air ladened with a higher residual vital force than exists over such highly positive regions of the earth. This increase in the vital energy of the atmosphere will compensate for the loss in vital energy to animal life by the greater electrical union between the solar and the terrestrial electrical energies and the consequent increased depression to animal life from such an increase of heat production over areas of the earth having the greatest mass exposed during the period of new moon. But this upward flow of the atmosphere along this positive area of the earth in electrical union with the moon will not only exert a cooling effect on the earth's surface by such inflow of atmosphere from regions having a cooler atmosphere and greater residual vital energy, but the rising of this atmosphere into strata of higher altitudes will cause a greater precipitation of moisture than would occur under a less disturbed condition of the atmosphere, consequently we may expect more rain and wind storms during the day and before midnight during the period of new moon than at other times, especially over highly heated areas within and near the tropics and within the temperate zones, diminishing in effect with distance from the equator. Thus, during the periods of new moon, the earth is subjected to greater heat radiation during the nights, consequently to cooler nights, while the earth rotates under the sun with its negative electrical force undiminished as during periods of full moon, consequently will be subjected to a greater production of heat during the day. Thus the earth will have cooler nights and hotter days, hence greater extremes of heat and cold as well as be subjected to more sudden rainfall, more electric storms as well as more wind and hail storms and cyclones during periods of new moon than during periods of full moon.

The attractive force of both the sun and moon doubtless have a very decided effect upon the raising of moisture from the subterranean sources, streams, etc., under the earth's surface. (The reader is again referred to Plate X). It is the opinion of the writer that capillary attraction is possibly due to the attraction between the earth and other electrically reciprocal bodies. If this be true, then, the moisture flowing in subterranean streams may, like the ocean water, be attracted by the force of the moon exerted upon the earth and be lifted and flow as capillary attraction through the porous earth to the neutral point, where the electricity of the earth combines upon or near the surface of the earth with the electricity of either the sun or moon, the moisture thus raised being vaporized by the production of heat at such point of union between the terrestrial and solar electricity direct from the sun or reflected from the moon's surface. If this point of union occurs near the surface of the earth, then such moisture may be utilized by the roots of vegetation in the growth and development of such vegetation; but if this union occurs above the roots of plants, then the plants may drink from this water supply brought from the earth's interior as it passes the level of such roots on its way to the point of electrical union. If this union occurs at or above the earth's surface then the moisture may become vaporized and add to the humidity of the surrounding atmosphere and to the formation and augmentation of clouds which thus assist in increasing the production of rainfall, or a goodly portion of this moisture may be distributed to plants in the form of dew, during the night, most especially if the atmosphere be sufficiently cooled to so reduce the intermolecular spaces of the air molecules to the point of saturation by the contained moisture; or if the air is heavy and there be no wind, the moisture thus raised by capillary attraction may saturate the surface atmosphere only and be shown in the form of mist and fog. But if the night be cloudy, the fact that the clouds enshroud the earth will retard the radiation of heat from the earth and thus produce greater expansion of the intermolecular spaces of the intervening atmosphere, between the earth and clouds, and in so doing increase the capacity of the atmosphere to contain moisture which, rising to the region of such clouds, causes the terrestrial moisture to be raised to the cloud line, where it unites with the clouds to augment the clouds without being precipitated upon the surface of the earth in the form of dew, fog or mist.

This same force will also act between the earth and sun at all times during such periods of the year, when the earth and sun reciprocate over any surface of the earth. Especially will this occur when the negative first quadrant of the earth is coming into position for the sun to act upon such surface of the earth, the moisture rising from the earth with the negative terrestrial flow and being evaporated and held within the intermolecular spaces of the atmosphere, the heat formed from the sun's force serving to increase their expansion and the consequent capacity of the air for holding moisture. The moisture will thus remain in the atmosphere to augment the clouds or during periods of new moon be carried upward by ascending currents of air, as already indicated, to increase the rainfall and general precipitation of moisture in the form of rain or hail, with wind storms or cyclones over the earth's surface. Thus it is that the sun and moon become instrumental in drawing moisture from the subterranean streams to the earth's surface to add to the growth of vegetation and to the general water supply for the needs of both vegetable and animal life upon the earth.

Thus we may say that one function and a very important function of the moon is to assist in the raising of the earth's subterranean or subsurface moisture to the earth's surface where it may be the better utilized for the needs of all forms of life upon the earth's surface.

All of the electrically positive portion of the moon that lies within the field of vision serves to unite with and render neutral such electrically negative portion of the terrestrial electrical force of the earth as may be necessary to satisfy the exposed positive portion of the moon's surface, consequently the normal affinity of the earth for electro-vital force from the sun is reduced to that extent. Hence it is that the moon serves to reduce the affinity of the earth for the electro-vital force from the sun below that degree proportional to the mass of the earth.

The full moon also serves to illuminate and to warm to a certain extent, to both illuminate and hence to mitigate the cold of such unilluminated surface surrounding the unilluminated pole as may be, by virtue of its electrical reciprocation with the illuminated positive surface of the moon, lying within the field of vision.

Thus by reducing the earth's affinity for the electro-vital force surrounding the sun the heat producing power of the earth is reduced to that extent; hence the moon serves to modify the heat of the torrid zones and to the cold of the frigid zones over such surfaces in electrical communication with the positive surface of the moon.

While the position of new moon serves to draw upon the positive force of the earth to satisfy the electrically negative surface of the moon, giving rise to a rising atmosphere and consequent hail, rain and cyclone storms following a more highly heated state of the earth's surface than during periods of full moon, yet this condition only exists in its fullest extent for such period as the face of the moon is wholly electrically negative; for just as soon as the moon passes from its position of new moon it begins to turn a small portion of its electrically positive surface toward the earth, which at once communicates with the electrically negative surface of the earth to draw and reduce the terrestrial negative state of the earth, reducing the normal affinity of the earth to that extent for the electro-vital force from the sun, which condition continues to increase to the position of full moon and then to decrease to the position of new moon.

THE INFLUENCE OF THE EARTH AND THE SUN UPON THE MOON.

While the moon exerts a beneficent influence over the entire earth, in regions where extreme heat is felt and in regions subject to cool nights, in modifying that heat and in preserving a higher degree of residual solar electro-vital force within the atmosphere breathed than would be possible without the influence of the moon, also in regions around the unilluminated pole in giving the light of the moon and in reflecting the beneficent influence of the solar rays upon the unilluminated surfaces surrounding the unilluminated pole during the long winter season of such localities; yet the earth likewise reciprocates these beneficent influences by lessening the extremes of heat and cold upon the surface of the moon. During the period of full moon, the earth, as we have shown, relieves the electrical tension upon the positive face of the moon by drawing a portion of this electrically positive force from the otherwise would-be highly heated state of the illuminated surface of the moon, yet by the earth drawing upon the illuminated surface and constantly reducing its positive electricity the moon's electrical tension is lessened and its intense heat producing power is likewise lessened. As the earth is greater than the moon the drawing force will be correspondingly greater upon the moon's surface than upon the earth's surface, consequently the heat producing power will be correspondingly lessened upon the moon's surface, which, combined with the small diameter of the moon, would make the days comparatively cool upon the surface of the moon, were it not exposed to the sun's rays during long pediods of time, thus permitting a greater production of heat by a greater accumulation of solar electricity. During the period of new moon the earth will reflect the solar electricity from its own surface to that of the moon, which, uniting with the negative electricity of the moon, will produce heat upon the unilluminated surface of the moon; thus during the period of new moon, the unilluminated surface of the moon will be heated by the sun's positive rays received by the earth and reflected to the moon from the earth's second quadrant uniting with the negative electricity of the unilluminated surface of the moon, producing heat by such electrical union and thus reciprocating the favor that the solar illuminated surface of the moon gave to the earth during the nights of full moon.

The surface of the moon exposed to the earth is doubtless interspersed with mountains, hills, valleys, plains, streams, rivers, lakes and possibly large bodies of water, as seas, etc. The lighter hemisphere of the moon is exposed to the sun's rays at the period of new moon, hence that side opposite the constantly exposed side of the moon to the earth is doubtless covered principally with water, the movements of which possibly assist to modify the extreme heat of the sun by the general distribution of the surface heat to remote portions of the moon's surface and to greater depth of the moon's waters through ocean waves, etc. Thus the surface heat from the solar exposure of the moon during new moon may become stored as latent heat within its waters to assist by combining with the internal heat of the moon to modify the extreme cold that might otherwise be possible upon the moon's surface during periods while unexposed to the sun's rays while making the circuit throughout other portions of the moon's orbit around the earth. To aquatic animals this condition may not prove disastrous or even detrimental to life. Possibly it will pass as a short winter or rest season. The terrestrial surface of the moon will receive solar illumination during a period of more than 14 days each month, while during new moon the terrestrial surface of the moon is subject to terrestrial illumination only, yet during full moon the solar illumination predominates over the terrestrial illumination. Thus the terrestrial surface of the moon is one constant day, varying in degree between the solar illumination during one-half of the lunar month and the terrestrial illumination throughout the entire lunar month, which is as much brighter than the full moon upon the earth as the earth is greater than the moon, thus the moon, instead of being a barren waste as considered by some scientists of the present day, is doubtless covered and filled with many forms of both plant and animal life, to sustain which appears to be the constant purpose of material creation.

Doubtless there are many other phases and functions of the moon that we have not as yet mentioned, yet as we have already consumed more space than was originally intended for that subject, we will be content to drop the subject of the moon and pass to the consideration of this universal electro-vital force in producing the movements of the planets around the sun. We shall not undertake to follow the movements of the satellites of other planets than the earth, but shall attribute their movements to this great general cause, and while the combinations may vary to some extent to that given for the moon, yet we feel confident that this great universal force will be found to be the moving cause in all the combinations that may be required in producing any or all the various movements of any or of all the satellites and of all other heavenly bodies as well.

CHAPTER XVI.

THE APPLICATION OF ELECTRO-VITAL FORCE TO ALL THE PLANETS OF THE SOLAR SYSTEM.

In our description of the planets of the solar system we shall not enter into details further than may be necessary to apply our principle as the controlling force in producing the movements of the planets of greater magnitude, not entering into a description of the smaller bodies, feeling that if this great universal force can be applied to the production of the movements of the bodies of larger magnitude, that this same force will apply to the production of the movements of the smaller bodies as well.

The planets of the solar system are divided into two groups; first, those revolving in orbits lying between the sun and earth, called Inferior Planets; 2nd, those revolving in orbits lying without the orbit of the earth, called Superior Planets.

THE INFERIOR PLANETS.

Mercury. Mercury is the first planet in order from the sun. Although some astronomers claim to have discovered another planet, Vulcan, between the sun and Mercury, yet it is not as yet established that a planet does so exist. Mercury revolves around the sun once in 87.97 days. Mercury revolves on her axis once in 24 hours, 5 minutes and 28 seconds. The diameter of Mercury is 2992 miles. The mean distance of Mercury from the sun is about 35,750,000 miles. The orbit of Mercury is the most eccentric of any of the planets of the solar system, being about 1-5 of its semi-major axis, thus proving a greater variation in the density of her hemispheres than that of the earth. The orbit of Mercury is the most inclined of any of the planets, being about 7°00′08″ greater than that of the earth, thus making the orbit of Mercury inclined to a perpendicular to the earth's equator 30°27′48″.

As Mercury revolves between the earth and the sun an observation of Mercury cannot be had only as she turns her unilluminated side toward the earth, which view is somewhat obscured by the illumination of the sun. It is not certain whether Mercury has an atmosphere, yet it is thought that she has. The brightness of the sun prevents definite inspection of the surface of Mercury, consequently but little is known of the general outline of Mercury's surface.

The density of Mercury is 6.85, compared with the greatest density of pure water at the point of crystallization. Mercury, compared with the density of the earth, is 1.21.

As Mercury revolves around the sun with her ecliptic even more inclined from her equator than the ecliptic of the earth is inclined to the equator of the earth, we find that Mercury will be subjected to similar electrical changes during her revolution around the sun that the earth is subjected to in her revolution around the sun, consequently Mercury will be alike influenced as the earth, hence we conclude that her movements are due to the same forces and are similarly produced as are the movements of the earth, both diurnal and annual.

ELECTRO-VITAL FORCE—A UNIVERSAL FORCE.

The writer is of the opinion that electro-vital force is not confined to the solar system alone, but rather it is a universal force existing throughout the universe; that all heavenly bodies possess the power to attract this universal force; that the power to attract this force will vary directly as the mass contained within each heavenly body; that the diameter of the volume of space from which each body attracts this universal force is directly proportional to the diameter of the mass in each body, when the various bodies are reduced to equal density.

If the above views of the writer are correct, in order to compare one heavenly body with another, we must first reduce each to the same density and then consider their respective fields of prevailing attractive influence as proportional to their respective diameters. (See Plate XIV,, Sec. one). Let it be further understood that within the field of prevailing attractive force of any heavenly body, that any mass or substance within such field of attraction will be drawn to such body and further that such body will draw unto itself and prevail over any other heavenly body in attractive influence for electro-vital force within such field of attraction, during the times that such body retains and maintains its normal affinity for electro-vital force; but whenever the normal affinity for electro-vital force within a planet becomes either wholly satisfied or becomes reduced below the affinity existing within some other heavenly body, with a field of attraction adjacent to the field of attraction to the first body, then the flow of electro-vital force will start from the field of the first and flow in the direction of the second body and continue to flow until the affinity within the second body becomes reduced to the same degree of attraction and the electrical pressure becomes raised to the

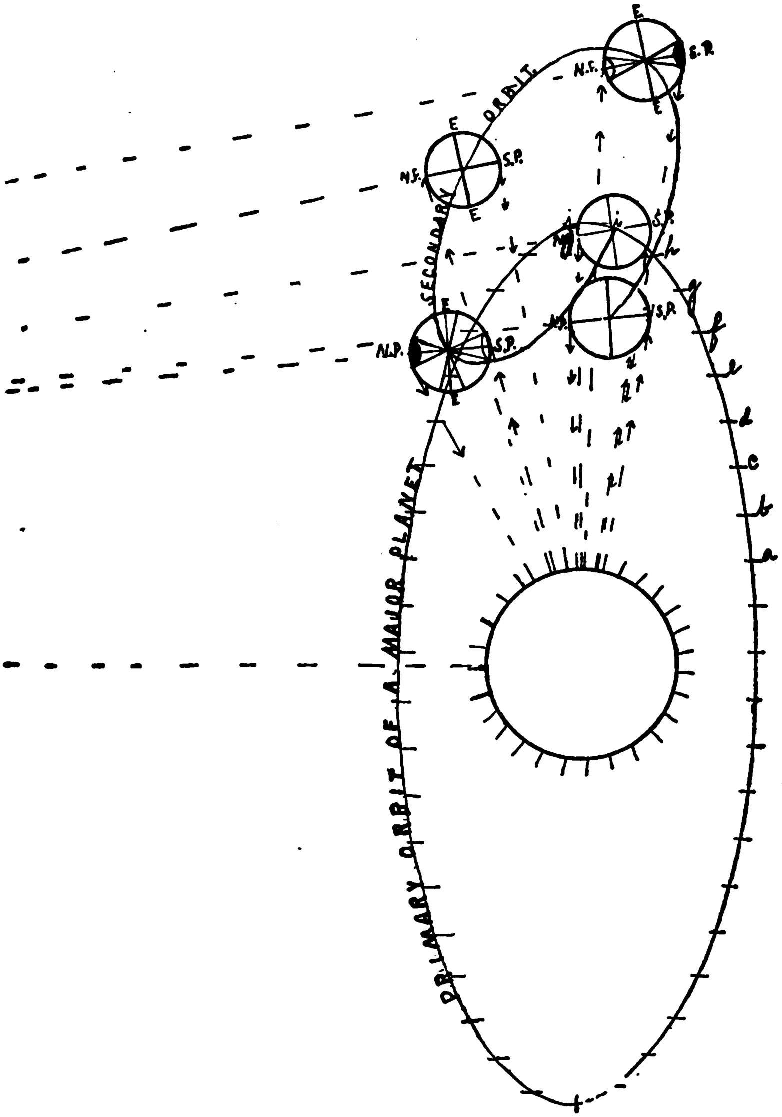


PLATE XIII. HARTFORD.

same degree at the point of tangency of the two fields of attraction. Yet the electrical pressure does steadily increase from the common point of tangency to the mass of each body so influenced. Thus we find the sun exerting the prevailing attractive influence over each planet acting upon all electro-vital force and upon all masses within the field of its prevailing influence, and the respective planets likewise exerting the prevailing influence over like forces for certain approximate distances from their respective centers, proportional to their masses. (See Plate XIV., Sec. one.)

The field of attractive influence is exerted in prevailing force for an appropriate distance

From the sun toward Mercury 37,145,300; from Mercury toward the sun 604,700 miles.

From the sun toward Venus 64,828,000 miles; from Venus toward the sun 1,922,000 miles.

From the sun toward the earth 89,281,000 miles; from the earth toward the sun 3,219,000 miles.

From the sun toward Mars 139,057,700 miles; from Mars toward the sun 1,940,300 miles.

From the sun toward Jupiter 439,086,000 miles; from Jupiter toward the sun 41,914,000 miles.

From the sun toward Saturn 845,600,000 miles; from Saturn toward the sun 36,400,000 miles.

From the sun toward Uranus 717,863,300 miles; from Uranus toward the sun 56,136,700 miles.

From the sun toward Neptune 2,694,200,000 miles; from Neptune toward the sun 85,800,000 miles.

By considering the distances between the sun and the various planets, we find that if a circle were drawn around the sun and each planet denoting the limit of prevailing influence that the sun has over the planet and that of the planet over the sun, we will find those circles will become tangent to each other along the line connecting the center of the sun and the center of the planet compared. This point of tangency will denote a position at which the attractive force of the sun and that of the planet compared will be equalized upon any mass of force that may exist at such point. Such point will denote the point of attraction between the sun and such planet. Any substance within either circle, however near such point of tangency, will incline to be drawn toward the mass exerting the controlling influence over the space surrounding such substance.

Plate XIV, Sec. one, is intended to represent the fields of prevailing attractive influence exerted by the sun and the planets of the solar system as far as Mars. The distances being so great between the sun and the more distant planets, and the difference between the mass of the sun

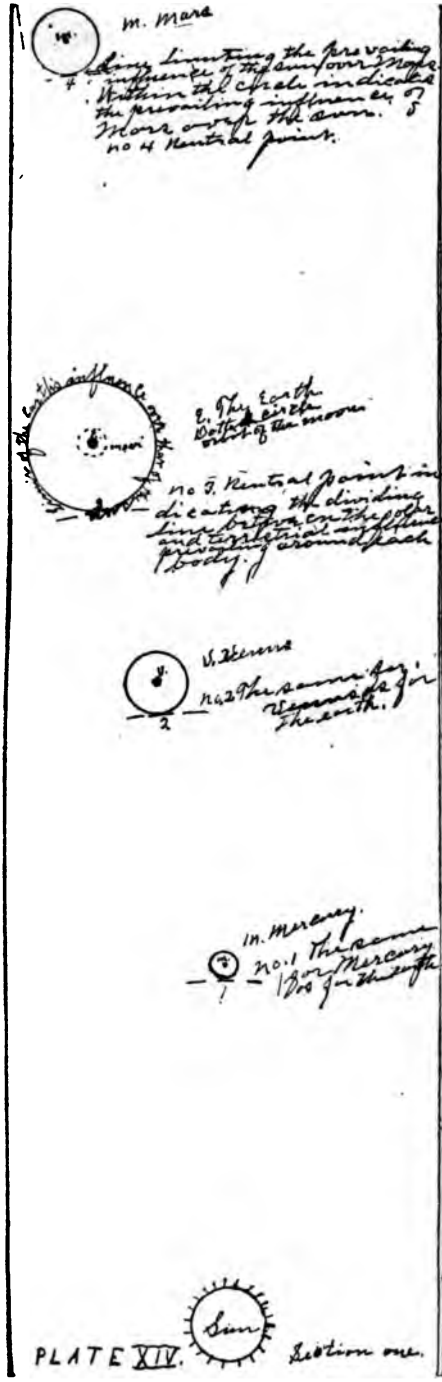

m. Mars
Line limiting the prevailing influence of the sun over Mars. Within the circle indicates the prevailing influences of Mars over the sun.
4
no 4 Neutral point.
E. The Earth
Dotted circle orbit of the moon
moon
earth's influence over the
no 3. Neutral point indicating the dividing line between the solar and terrestrial influence prevailing around each body.
V. Venus
no 2 The same for Venus as for the earth.
2
M. Mercury.
no. 1 The same for Mercury as for the earth
1
Sun

PLATE XIV. Section one.

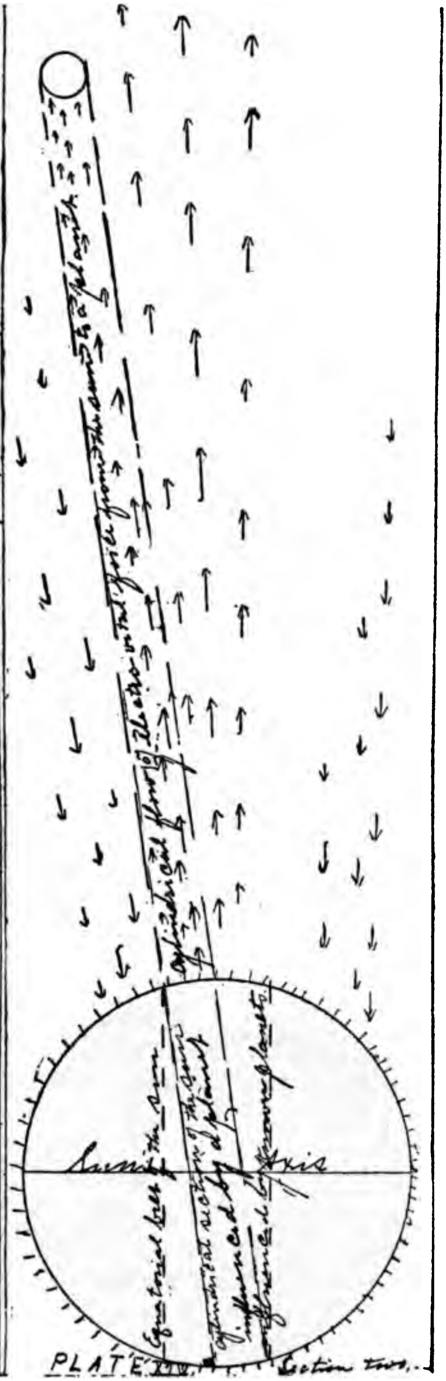

Cylindrical flow of Electro-vital force from the sun to a planet
Equatorial line of the sun
Cylindrical section of the sun influenced by a planet
influenced by ... over planets
Sun's Axis

PLATE XIV. Section two.

and some of the planets being so great, renders it impossible to give position to all the planets upon the limited space of the plate. To represent all the planets, a plate should indicate as follows: Let the letter S. represent the circle for the sun. Let the diameter of all circles representing the planets be proportional to the diameter of the mass of the planets that each represents. Let all circles representing planets be placed at a distance from S., proportional to the distance of the planet from the sun. The following table will give the dimensions of such circles and the distance that each must be placed from the circle S.:

Scale of miles, one million miles to the linear inch.

Mercury, diameter of circle, .014 inch; distant from S., 37.75 inches.
Venus, diameter of circle, .0256 inch; distant from S., 66.75 inches.
Earch, diameter of circle, .031 inch; distant from S., 92.5 inches.
Mars, diameter of circle, .012 inch; distant from S., 141 inches.
Jupiter, diameter of circle, .082 inch; distant from S., 481 inches.
Saturn, diameter of circle, .0366 inch; distant from S., 882 inches.
Uranus, diameter of circle, .0281 inch; distant from S., 1,774 inches.
Neptune, diameter of circle, .027475 inch; distant from S., 2,780 inches.
The Sun, diameter of circle, .86 inch.

By observing the above table it will be seen that only two planets, Jupiter and Saturn, have a mass in excess of the mass of the earth, when all are reduced to the same density. On the same scale and proportions used in the above table, the following table is prepared to represent the distance of the prevailing attractive influence of the sun, and of the planets, respectively, reaching in every direction from their respective centers, the fields of attractive influence being considered as reaching from the center of the sun and from the center of the planet under consideration and meeting at the point of tangency upon a line connecting the sun with the planet. Such point of tangency being the point of equilibrium in attractive influence between the sun and the planet under consideration. On the above scale each field of prevailing attractive influence for the sun and for each of the following planets is represented as follows. The letter S. representing the sun being considered the center of the field of attraction for the sun, while the position of each planet distant from the sun is represented as proportionately distant from S. and the field of attraction of each such planets centralizes around the point representing the relative position of such planet from S. (Scale, one linear inch to each million miles.)

The sun toward Mercury, 37.1453 inches; Mercury toward the sun, .6047 inch.

The sun toward Venus, 64.828 inches; Venus toward the sun, 1.922 inch.

The sun toward the earth, 89.281 inches; the earth toward the sun, 3.219 inches.

The sun toward Mars, 139.0577 inches; Mars toward the sun, 1.9403 inches.

The sun toward Jupiter, 439.086 inches; Jupiter toward the sun, 41.914 inches.

The sun toward Saturn, 845.6 inches; Saturn toward the sun, 36.4 inches.

The sun toward Uranus, 1,717.8633 inches; Uranus toward the sun, 56.1367 inches.

The sun toward Neptune, 2,694.2 inches; Neptune toward the sun, 85.8 inches.

It will be seen that while the more distant planets, as Uranus and Neptune, neither of which have a mass equal to that of the earth, yet their great distance from the sun give them a very much wider field of prevailing atractive influence. It will be further observed that the moon of the earth falls within the earth's field of prevailing attractive influence, so with all other of the more distant planets, they each doubtless have satellites revolving around each, which revolve within the limits of their respective fields of prevailing attractive influence, over which each planet exert the controlling or prevailing influence over any and all masses within their respective fields. As the mass of the sun is many times greater than any one or even the combined mass of all the planets and their satellites within the solar system, the sun will consequently draw from a proportionately wider volume of space than it is possible for any one or all of its planets combined to draw from.

Consequently Electro-Vital Force within the solar system reaching far beyond any planet of the solar system will incline to centralize around the sun, save a proportional space around each planet, and become very much condensed and extremely active upon the surface of the sun and within the mass of the sun. This force will permeate every molecule and fill every intermolecular space within the sun's mass. Possibly such condition will partially account for the low specific gravity of the sun. The sun drawing from such a wide volume of space will accumulate such an immense volume of energy that the affinity existing within the sun for this energy will after a time become neutralized. As the affinity within the sun begins to become satisfied then the sun begins to lessen its attractive force for this energy. This energy on coming in contact with the contained energy within the sun will produce such a degree of heat as the energy from the sun is capable of producing. The union of the inherent energy of the sun with this universal energy, according to the views of the writer, will produce a new electrical molecule having its affinity either partially or fully satisfied, both for the energy within the sun and for this universal electro-vital energy, hence such molecule will become electrically about neutral. But in the union of its contained elements a degree of heat is produced that gives to this new molecule an expansile force. Such union taking place within the sun's mass or within the mass of any planet inclines to reduce the specific gravity of the sun, or planet, both by resisting the cohesive force of the sun's or planet's mass and by increasing the intermolecular spaces surrounding its molecules. It appears that the electrical atom belonging to all matter has a two-fold affinity, one leg of which clings to all matter or substances of its own kind, while another leg goes out to draw from electro-vital force to satisfy the affinity that may exist in such atomic leg. Thus in the union of the inherent solar electrical atom with electro-vital force the affinity existing within one leg of the solar electrical atom becomes either partially or wholly satisfied, while the remaining leg in such solar electrical atom still clings to the sun. But in the union of the electrical atom within any mass or heavenly body with universal electro-vital force, a degree of heat is produced that causes an expansion of the partially neutral molecule thus produced, which produces an expansile force that causes the almost neutral molecule to incline to pass in the direction of least resistance, hence away from the surface of such heavenly body and in so doing serves to either greatly weaken or to break the atomic hold of the remaining leg from the mass of such heavenly body while the expansile force, continuing in sufficient force, causes such electrical molecules to rise and part from the mass of such heavenly body. But the affinity or atomic grasp upon such mass, although broken, still remains unsatisfied within such partially neutral electrical molecules as they are caused to rise by the expansile force from the heat produced in atomic contact against the force of gravity. Rather such unsatisfied affinity within such atomic leg, while such molecule remains within the realm of the preponderating electrical influence of such heavenly body, constitutes the power of gravitation of a heavenly body or mass of matter for other matter within the realm of its prevailing electrical influence, hence all matter coming within the realm of the electrical influence of any planet, when sufficiently released from resisting forces, will be drawn or rather, by virtue of the unsatisfied affinity existing within such lesser mass, will travel to the mass capable of satisfying the existing affinity within such atomic leg as attracts and is attracted to all matter.

(Note—The affinity constituting the atomic leg, referred to above, having an affinity for the sun's mass, is more properly produced by the general attractive force of such portions of the sun's mass as may possess an opposite electrical state from that electrical state of the solar electrical atom being released from the releasing neutral molecules as they rise from the equatorial belt of the sun. This principle may be the more easily understood if we will consider the principle as being applied to the earth as it rotates upon its axis. It will be perceived that the earth's surface, as it passes under its daily solar exposure and more particularly under the zenith line, becomes electrically positive. The electrically positive surface then passes to the eastward of the zenith line and continues to be rotated until it is rotated upon the earth's surface opposite from the zenith line. As the electrically positive surface becomes rotated into that position occupied by the earth's surface at the hour of midnight, the negative atom is attracted to the earth by the greater drawing force of the opposite electrically positive surface of the earth passing under the zenith line, consequently the electrical atom of an earthy nature passes in that direction having the greatest drawing power for such electrical force, hence the terrestrial electrical atom lets go of the atomic grasp given to the solar electrical element, such grasp having now become weakened by molecular expansion, and the terrestrial electrical atom now passes back to the earth, increasing the negative electrical state of the earth's surface, thus assisting to produce an electrically negative state upon such surface of the earth, increasing in intensity as the opposite solar exposure increases in electrical intensity of the increasing positive electrical state as the earth passes under the solar exposure, while such solar exposure as gradually changes the earth's surface from a negative state to a more and more positive state and in so doing producing an increasing electrical attraction within such quadrant of the earth for the earth's electrical element held in a constantly weakening grasp by the solar electrical atom as it rotates into the position of the opposite electrical quadrant of the earth, when such grasp becomes entirely broken and the earth's electrical element becomes drawn back to reinforce and assist in producing an electrical equilibrium within the quadrants of the earth as they constantly change electrically under solar exposure, while the solar electrical atom becomes liberated to enrich the residual solar electro-vital force within the overlying atmosphere. (See Plates IV and XII.)

Such an immense number of partially neutral molecules as will be caused to rise along the equatorial belt of the sun and filling its atmosphere with partially neutral molecules will produce an evanescent state of the solar atmosphere along the equatorial belt sufficiently strong to cause such partially neutral molecules to rise possibly for thousands of miles above the surface of the sun before becoming sufficiently liberated as to permit the solar electrical molecules to return to the sun. It will be seen that this state will be most pronounced along the equatorial belt of the sun, by virtue of the great depth of the solar mass and by virtue of the great momentum given to such molecules while in contact with the sun's surface and within the solar atmosphere, due to the great rapidity with which such molecules are hurled through space along the solar equatorial belt as the sun rotates upon its axis, which over the equator of the sun acquires the great speed of 1 1-5 miles per second, 72 miles per minute, 4336 miles per hour, 108,071 miles per day and 2,701,776 miles every revolution of the sun upon its axis, which occurs once in 25 days. Thus most especially over the equatorial belt of the sun will be produced a rising atmosphere ladened with nearly neutral molecules, having for the time separated from the sun's mass and consequently being for the time the more easily thrown from the sun's equatorial surface.

But such atmosphere on rising will permit of still greater expansion and a constant weakening of the tie that binds the atoms composing such molecules. Thus the atmosphere surrounding the equatorial belt of the sun for a great depth possibly for thousands of miles, will be filled with rising neutral molecules, while the atmosphere over the remaining portion of the sun's surface remains with a more active energy, having an unsatisfied affinity for the inherent electricity of the sun's mass. But these partially neutral molecules will continue to rise as long as the expansile force continues active between the atoms composing the molecules, until they finally reach a point in which the weakened affinity existing between the atoms composing each molecule is too weak to longer hold the molecule in combination, and no sooner does this weakening begin even along the lower strata of the solar atmosphere than the surrounding universal energy with an active unsatisfied affinity utilizes such weakened grasp by entering into the combination through such atomic grasp as may be thus partially liberated. Thus as within the blood stream under an insufficient supply of oxygen the carbon element may unite with such oxygen supplied to form the molecule CO, and on coming in contact with an increased supply of oxygen the combination CO may unite with more oxygen forming CO2, so may this almost neutral molecule now unite with an increased universal electro-vital energy to increase the universal electro-vital energy constituent within its molecule and render such molecule fully neutral. Thus while the immediate atmosphere surrounding the equatorial belt of the sun may be similar to CO, (the solar atom being here represented by the letter C) then on rising a little above the solar surface and taking on more of the element contained in electro-vital force, such element of electro-vital force we will represent by the letter O; the molecule will now become as CO2; then on rising a little higher and becoming more and more enriched with electro-vital force and the expansile force more and more enlarged until the element C will become sufficiently weakened to no longer hold the atoms in molecular combination, when the affinity existing within the leg having its atomic hold broken from the solar mass with its affinity still remaining unsatisfied will now prevail over the remaining leg and cause such electrical atom to return to its mother mass within the sun; while the electro-vital force thus liberated will become less and less adulterated with electrical force of a mass nature, when the electro-vital force thus being freed may be thus represented as passing from its union with CO_2 to simply O_2, then being more and more refined and becoming O_3. Thus gradually passing from the solar surface at first combined in a form analogous to CO, or carbon-monoxid, then becoming somewhat freed and becoming analogous to CO_2, or carbon-dioxid, then becoming still more freed and becoming analogous to O_2 or oxygen; then becoming still purer as it rises from the solar surface until it finally becomes analogous to O_3, or ozone. Thus in its most active form it becomes liberated to pass into such position and into such space where it may be drawn to the various bodies of the solar system to there accomplish its mission in assisting in the production of heat and in the promotion and sustenance of life upon such heavenly bodies.

As a sea of this atmosphere surrounds the earth, so a sea of this universal electro-vital energy with an actively energized unsatisfied electrical affinity surrounds the sun, filling its mass and covering its surface, decreasing in density as distance increases from the sun.

But such a constant electrical union upon the surface of the sun and within the mass of the sun would after a time satisfy the existing affinity within the sun for this force. When such a condition would arise the sun would then begin to repel this force and after such time cease to attract this force. Such would be the state of the sun, were not the sun influenced by some external force or forces. We find that the sun has innumerable bodies revolving around it. Most prominent among these bodies are the planets of the solar system, with their respective satellites. These bodies are constantly drawing the surplus energy from the sun and by such depletion of the force within the sun, the affinity within the sun is as constantly being renewed to draw such force as may be required to take the place of the force being thus emitted from the equatorial belt of the sun. Thus along regions distant from the equatorial belt of the sun, even to the polar regions of the sun, the surface of the sun may be in slow sluggish yet in a more or less active affinity for electro-vital force, which such portions of the sun draws from surrounding space to satisfy such affinity as may be being constantly renewed by virtue of the constant depletion of electro-vital force along the equatorial belt of the sun to supply the various planets of the solar system.

We find the sun revolving once upon its axis every 25 days at an angle to the ecliptic of 82°45′. This makes the equator of the sun vary from the ecliptic at an angle of 7°15′. As all the planets revolve in orbits comparatively near the ecliptic, varying with Mercury as much as 7°00′08″ to in the case with Uranus of only 46′20″, it becomes evident that the influence of the planets are all exerted upon the sun's mass near the line of the ecliptic. As the ecliptic varies but 7°15′ from the equator of the sun it becomes evident that the influence of the planets must all be exerted within or near a belt varying but a few degrees from 7°15′ on each side of the equator of the sun. Hence the sun as it revolves upon its axis is all the time throwing off along its equatorial belt an influence to the planets of the solar system, and to all their respective satellites. The influence of the sun reaching out many times farther than the influence of any of its planets into space is able to draw from universal space this force to supply all deficiency in its electrical state caused by the force emitted to its planets. If this force is drawn from the surface of the sun, along its equatorial belt, then the affinity being constantly produced by such electrical release along the equatorial belt of the sun will cause this affinity to be produced upon and this force to be drawn from such surface as may represent the electrical antipode of the equatorial belt of the sun. This electrical antipode will then draw this force from its source of supply in space. Possibly the entire surface of the sun, save portions of its equatorial belt, is constantly and slowly drawing this force to supply the force emitted along portions of its equatorial belt to all the bodies of the solar system.

We will not undertake to say from whence this force originally was emitted into space. It has appeared to the writer that possibly this force had its origin in the celestial center from whence it as an energized active influence was emitted into space to hold the balance of the spheres in its grasp and to become the essential element to the continuance of life upon such heavenly bodies; that such force becomes the breath of life to all living forms, whether vegetation or animal, man or beast or creeping thing, or the fowls of the air, all are alike dependent for the continuance of their existence upon this wonderful life-sustaining force. Possibly this force possesses an element of the Omnipotent Himself.

We have not sufficient data at hand to enable us to more than conjecture whence is the force that causes the sun to rotate upon its axis. Yet we feel that it would be a conjecture not destitute of the elements of feasibility to assert that possibly the sun itself is constantly being influenced in such a manner from the force existing within the celestial center combining with the force emitted to the planets to cause the rotation of the sun upon its axis. Possibly the sun revolves in a secondary orbit under an electrical influence received from the celestial center, similar to the revolutions attributed by the writer to the major planets in secondary orbits over the sun and from the influence received by such planets from the sun, as hereinafter described in this work and illustrated in plate XIII.

There are points in which the finite mind becomes unable to longer follow the workings of the Infinite, where it must stop and content itself with that faith that all is well in every detail in the handiwork of God, where it must ever realize that God is here as well as there and that His care is ever over those who earnestly strive to make their life harmonize with the laws of life in Nature. He will not destroy those who seek to promote life and happiness rather than to destroy life and produce misery and destitution, and that He will ever bless those who strive to assist Him in giving life and in cultivating that spirit of life that for a time takes up its abode in the physical body, that it may be the better enabled to harmonize its own activities to the beneficent workings of natural law, that in so doing it too may be the better enabled to promote life and cultivate a wider intelligence of the great harmony in Nature and to know through experience that the practical realization of the acme of true happiness may be found in this life that we now live rather than to be enjoyed in some unknown realm of future existence; that to know and obey the laws of life brings that enjoyment practically experienced in life that we all seek. Such is the intent of God for all creatures throughout the realm of creation. But woe cometh to him who disregards the laws of life, who heedlessly sows the elements of friction and discord in the mechanism of Nature that brings disastrous results to the living and a life of disease, misery and death to the unborn. Woe to him who destroys the elements of life and in so doing annuls the true object of a dual existence, that the lust of the flesh may find a fleeting gratification and that pride and selfishness may be temporarily enthroned. Truly one had better never to have been born than to so act as to annul the laws of life in his own being and to willingly and grossly ignore the true object of God in giving to man a physical existence.

The mind will conceive of the sun being energized with a constant flow of this electro-vital force flowing toward the sun at all points save along its equatorial belt, where the neutral influence of satisfied neutral molecules, combined with the attractive force of the planets and the sun's momentum is serving to cause a bulging outward from the atmosphere of the sun along its equatorial belt.

Thus there will be a flowing toward the sun from all points save along its equatorial belt which will be flowing outward from the sun toward the planetary bodies, similar to the flow of an artesian well, and after supplying the bodies of the solar system a constant return current back to the sun along planes on each side the equatorial belt back to the polar extremities of the sun, to do the original work over again in keeping a constant supply of this electro-vital force for the bodies of the solar system, flowing constantly from the equatorial belt of the sun toward such bodies. Yet such neutral electrical molecules will rise only for a comparatively short distance from the sun until they break their combination and the solar electrical element will gravitate back to the sun, leaving this electro-vital force free. Yet we can conceive of this electro-vital force continuing within such current as it falls within line of some electrical flow leading to some planet, or in failing to become influenced by some planet, gravitating backward to the sun with such force as may exist within the affinity of the sun for this force. Thus at all times there may exist within the equatorial belt of the sun a degree of attraction for this force, yet to a much weaker degree than elsewhere along the surface of the sun where this attraction is not so much weakened by a rising atmosphere of neutral electrical molecules. (See Plate XIV, Sec. 2.)

HEAT RADIATION FROM THE SUN.

The reader must first eliminate from his mind all conceptions of former teachings concerning the possible immense heat that is said to be constantly radiated from the sun and consider the sun not as an immense molten mass, with heat that is being constantly reduced by radiation into space; but consider the sun as an immense mass having but the light specific gravity of only 1.444 and capable of drawing unto itself after its inherent affinity is once satisfied only that degree of universal electro-vital force necessary to constantly satisfy the affinity for electro-vital force that is being constantly reproduced for electro-vital force to take the place of that being constantly given off to supply the various planets with their satellites within the solar system. Such being the case the surface of the sun may at present have but a small degree of affinity compared to its mass. We can conceive of this condition when we consider a mass of the earth remaining inert during the winter season, while the affinity is being constantly reduced within such mass, resulting in a reduced production of heat, as has been explained previously in this work. Such a state may be produced by the relation that may exist between the sun and other more immense heavenly bodies as the celestial center, or possibly other centers to which the sun itself may be a minor body, data concerning which we have none at the present time. Then we may ignore the existence of any such relation and consider the sun as we have already considered its electro-vital replenishment, as drawing constantly from the space of the solar system to replenish its electro-vital force. If we so consider the replenishment of the sun, we are again confronted with the question: Whether the degree of heat produced within a certain mass, by union with electro-vital force being drawn from space, having a less dense atmosphere in electro-vital force to a mass having a more dense atmosphere in electro-vital force, is less intense than the degree of heat produced by electro-vital force being drawn from an atmosphere more dense in electro-vital force to an atmosphere less dense in electro-vital force? If so, then the heat produced upon the sun's surface by electro-vital force being drawn to the sun from the space of the solar system may not be so intense proportionately to the existing affinity and mass influenced as the heat produced upon the surface of the earth proportionately to the affinity existing within and the mass influenced upon the earth's surface. These are relations and conditions as yet unknown, which cause the thought to arise in the mind of the writer that the heat produced upon the sun's surface may possibly be of a very mild degree. In fact, the climate produced upon the surface of the sun may be a very paradise for the abode of life, as electro-vital force may be flowing to the sun and uniting with the electrical flow from such portion of its mass as may possess an affinity for this force, which may be from every outward direction, save along lines over the equatorial belt of the sun leading to various bodies of the solar sstem. It further appears possible for the surface of the sun to become constantly illuminated by the union of electro-vital force with the electrical flow from the sun's own mass, hence there may be no night there. If electro-vital force is an element of the omnipotent being of God, then the glory of God may thus illuminate and give constant day to this celestial orb, then it may be that within the sun itself and upon its surface those conditions combined may produce an abode that becomes the paradise of heaven, to those who may gain access to this magnificent orb, the sun.

But, granting that the sun is no more than a mass like our earth, capable of producing heat with an intensity proportional to its mass and its radiating powers alike proportional to its mass, are we then justified in supposing that the earth receives its heat from the sun? The mass of the sun has at present a specific gravity of 1.444, while that of the earth is 5.66. The diameter of the sun, if it were reduced to the same density of the earth, would be but 219,434 miles, which is but a little in excess of 27 times the diameter of the earth. Are we not justified in supposing that heat over homologous portions of the sun and earth is proportional to the respective masses so influenced? If condensation in electrical union is productive of both heat generation and heat accumulation in the degree of intensity of heat at any point, then are we not justified in concluding that heat will be lessened in production, intensity and accumulation by the dispersion of heat producing molecules through the widening of the intermolecular spaces at the points of electrical union and by the widening of the intermolecular spaces where heat may be confined as air rises after heat is produced?

Then if the heat produced upon the earth's surface will become so dispersed on rising as to permit the moisture within the atmosphere to become frozen into ice and snow on being carried upward but at most a few miles above the earth's surface, are we not justified in presuming that the heat of the sun will become likewise dispersed after rising a proportionately greater distance from the sun and that its influence will fail to become perceptibly felt long before it ever reaches the earth?

If the atmosphere capable of elevating the humidity existing within the air extends not to exceed a distance of but a few miles above the earth, we will say not to possibly exceed 50 miles, (scientists having calculated that the earth's atmosphere does not extend a distance to exceed fifty miles above the earth's surface) then are we not justified in presuming that the heat of the sun will become so dispersed as not to be perceptibly felt, as heat, at a distance of 27 times 50 miles, or a distance of not to exceed 1500 miles above the surface of the sun? But we have considered the sun and earth according to their relative diameters when reduced to the same density. For the sake of allowing every possible means, let us not only consider the relative diameters, but the relative masses of both the earth and the sun, yet it cannot be presumed that the intensity of the sun's heat is as many times as intense as the sun's mass exceeds the earth's mass, from the fact of its surface being so much greater than that of the earth. Yet let us take such a basis for a brief consideration of the possible heat radiated by the sun and received upon the earth. The sun as to mass is 326,500 times as great as that of the earth. Consequently, allowing that snow and ice is not produced short of a distance of fifty miles above the earth's surface, we find that 50 times 326,500 miles gives a product of 16,325,000 miles. On this basis we are justifiable in presuming that the heat of the sun will become so dispersed at a distance of 16,325,000 miles from the sun that snow and ice may be produced within the atmosphere through which the sun's heat constantly passes. Consequently the heat of the sun will become so dispersed long before reaching Mercury, Venus or the earth that its heat as such is incapable of producing a perceptible heat upon the surface of those planets or upon the earth. Consequently we conclude that what appears to be heat as radiated from the sun, is not heat as such; but all heat supposed to be radiated from the sun and felt upon the surface of the earth is produced at the points of electrical union between the respective electrical forces coming from the sun and earth, as has been already considered in this work.

Therefore we conclude that the sun does not radiate heat but radiates an essential element necessary to the production of heat capable of producing heat on coming in contact and uniting with its affinity within or upon the earth or within or upon any planet or mass of matter, as has been previously explained in this work.

ELECTRO-VITAL RADIATION FROM THE SUN TO PLANETS.

As has been already stated, the writer does not recognize the sun as a globe of fire or even as a molten mass, but rather as a globe filled with energy possessing the essential element necessary to the production of heat. Yet the sun possesses that degree of heat that is being constantly produced by union of the molecules within its own mass containing that element that becomes the suitable requisite necessary to supply and satisfy the affinity within universal electro-vital force for this element associated with the mass of the sun and contained within the masses of all planetary bodies as well.

This being our view we do not recognize the sun or any of the planets as possessing any greater degree of heat within themselves than the affinity of the sun or any of the planets respectively is capable of producing when coming in contact with this universal electro-vital force and having such affinity satisfied through such contact.

While a fire may burn the more readily and consume the fuel supplied with greater avidity when abundantly supplied with oxygen, or that associated element of oxygen that gives to oxygen its power to support combustion, it becomes evident that the existence of more oxygen than may become united with the carbon element to produce such combustion does not add to the total product of the heat produced in consuming the fuel supplied; so with the heat produced upon any planet or within the sun, the total amount of heat will depend upon the affinity existing within such body for electro-vital force and, when such existing affinity shall have become satisfied, the residual electro-vital force will add to the life-sustaining power within the atmosphere to all forms of life upon such body. The greater the degree of residual, or unused, electro-vital energy the greater will be the life-sustaining power of the atmosphere upon such heavenly body to sustain life upon the surface of such body which will not depend so much upon its mass as upon the degree of constant renewal of affinity within and upon such body for electro-vital force, consequently heat production will depend upon the degree of affinity that is being constantly produced, while the degree of affinity that is being constantly renewed or produced upon any heavenly body will depend upon the ability of such body to radiate its combination of neutral molecules from its surface to be reliberated and pass onward to enrich other space of the solar system with this universal electro-vital force. While the degree of heat produced depends upon the affinity maintained within any heavenly body through radiation, the life-sustaining power of the atmosphere upon such heavenly body will depend upon the degree of unused electro-vital force remaining uncombined within the atmosphere over such heavenly body, or liberated after being combined, as may be the case after the planet has rotated such atmosphere to the opposite side from the planet's solar exposure.

Holding these facts in mind, we will consider in order from the sun the little planet Mercury, which has an attractive force for this universal electro-vital force; but, as the diameter of her mass is very small as compared to the diameter of the mass of the sun, its attractive force will be exerted over a correspondingly less volume of space; yet, as this force is nearest found in its most dense and consequently most active form along the line connecting Mercury with the sun, it becomes evident that Mercury will find her electro-vital supply along the pathway connecting Mercury with the sun.

It is further evident that if the affinity within the sun for this force is more nearly satisfied along the equatorial belt than elsewhere upon the sun's surface that along such belt the gravitating force of the sun will be least for this force and that the influence of Mercury or any planet for that matter, will the more readily act along such pathway of least resistance and attract such force as may be flowing upward over such belt of the sun. It is further evident that if Mercury can receive a sufficient supply with greater readiness along the pathway connecting the planet and the sun that she will the more readily attract this force along such pathway covering the shortest distance between the two bodies to supply her demands. It is further evident that the density of this force being drawn to the sun lying along the pathway yet adjacent laterally to the equatorial belt, will by lateral pressure add to the force of the current flowing from this equatorial belt of the sun's surface upward in the direction of the planets of the solar system, and further that this lateral pressure will become less and the strength of the upward current correspondingly weakened as distance increases from the sun.

Therefore we conclude that the attractive force between two heavenly bodies acts directly parallel with and along the straight line connecting the centers of the two bodies and along such other lines parallel with this line that connect all points upon the smaller body with other points upon the larger body equally distant from the central line, all such lines entirely penetrating each body. Further, that the mass influenced within each body is included within such parallel lines as may contain both the smaller body and a cylindrical mass of the larger body equally distributed around the line passing through the centers of each body and entirely penetrating each body. (See Plate XIV, Sec. two).

THE DISTANCE OF ANY PLANET FROM THE SUN REGULATED BY THE AFFINITY MAINTAINED BETWEEN THE SUN AND THE PLANET.

Throughout this work we have observed and endeavored to show by resulting phenomena that two bodies attract each other only while there exists a reciprocal relation that will cause this electro-vital force to flow from the more highly energized body to the body less energized with this force and that, whenever the latter body shall receive a sufficiency of this force, at once there sets up an electrical repulsion between such positions thus satisfied upon two bodies, denoting the cessation of this mutual affinity and the consequent cessation of attraction between such portions of the two bodies. Therefore we conclude that the degree of attraction between two heavenly bodies will depend upon the degree of affinity that may exist in each for this electro-vital force and further conclude that, whenever the affinity for this force becomes satisfied within any heavenly body, it then ceases to attract other heavenly bodies, until an affinity is again established, through electrical radiation into space and to some other body having a less degree of electro-vital energy, when the original attraction will be again resumed. Thus the electrical radiation from the sun may serve to supply a body, as the earth, until such surface of the earth becomes electrically satisfied and a repulsion setting up through the expansile force of neutral molecules formed and electrical condensation causes the earth to be rotated away from the sun, exposing a new surface possessing an electrical affinity for the sun, while the former surface may give off its surplus energy to some other lesser body than the earth, as the moon, and further diminish its surplus energy by radiation into space—while the terrestrial electrical atoms become drawn back into mother earth to flow in the direction of the sun to add to and thus constantly replenish the affinity that is being constantly satisfied by the electrical flow from the sun. Thus the sun's surplus electro-vital force may be utilized to constantly supply and replenish lesser bodies within the solar system, that in turn may replenish still lesser other bodies until all are thus supplied, while all in turn radiate their surplus into space from which the sun is constantly replenishing its own force. Thus we are led to the thought that heavenly bodies do not in reality attract each other, but that they have the power to attract this electro-vital force; that when this force is mutually drawn by two heavenly bodies, the tendency is for the lesser energized body to approach the more energized body and attract the surplus force surrounding the more energized body, causing this force to flow in the direction of that body possessing the greater degree of affinity for this force as the lesser body, until such affinity shall become equalized between the two bodies, leaving the degree of electrical density surrounding each body proportional to the diameter of the mass in each when the masses respectively are reduced to equal density.

Further, when heavenly bodies repel each other, such repulsion is due to a condensation of the electro-vital force existing between and around each body, causing the bodies to move in a direction that will render the electrical density of this force surrounding each body more nearly proportional to their respective masses.

Thus, if for any cause, a heavenly body should be caused to approach too near the sun, wherein the electrical flow from the sun would produce an electrical accumulation beyond what the planet might be able to utilize and radiate to other bodies and to surrounding space, the electrical pressure that would soon arise between such planet and the sun would cause the planet to recede from the sun to that distance wherein the electrical flow would exactly balance the radiation from such planet to other lesser bodies and to surrounding space, when the planet would take its rightful position in space, relative to the sun, and continue its movements produced by virtue of the action of this electro-vital force upon such planet, both in revolving upon its axis and progressing in its orbit around the sun.

If this force acts between heavenly bodies only along such space of cylindrical volume as may entirely inclose and yet remain tangent to the smaller body, while it entirely penetrates the larger body remaining at all lateral points equally distant from the line passing through the centers of each body, then the attractive force between two heavenly bodies is equal to the pull exerted by virtue of the affinity existing between the lesser body and the mass contained within the cylindrical volume thus outlined through the larger body. (See Plate XIV, Section two.)

As the sun possesses the highest degree of electro-vital energy of any heavenly body within the solar system and as the mass contained within the cylindrical volume of attraction between the sun and any of its planets is greater than the mass of any planet within the solar system, and as the flow of electro-vital force is always from the body containing a higher degree of electro-vital energy to the body containing a lesser degree of electro-vital energy, it becomes evident that the direction of flow of electro-vital force taking place between the sun and any of its planets will always be from the sun to the planets.

It is further evident that the attractive force existing between the sun and any planet is always equal to the pull exerted upon the sun by the affinity existing within such planet for the electro-vital force existing within and surrounding the sun.

The existing affinity within a planet will cause an electro-vital flow to start from the sun to such planet and, after being once established, will become constant, such flow following the planet throughout its orbit at all times as a gleam of light connecting the planet to the sun. Thus a cylindrical volume of electro-vital force equal to a great circle of the planet will flow from a cylindrical mass through the sun's center of equal area and continue to flow for all time to such planet from the sun, following the planet throughout its orbit. (See Plate XIV, Sec. 2). Thus through similar cylindrical volumes each planet is constantly renewing its electro-vital force from the sun as the planet revolves around the sun, while such planets in turn are radiating this force into surrounding space; while the sun is constantly replenishing its electro-vital force by again gathering this force from space through the attractive power of the affinity that is constantly being renewed within the sun, through a constant radiation of this force along the equatorial belt of the sun in replenishing the planets and minor bodies of the solar system. It is evident that the more rapid the renewal of affinity within any planet and the greater the mass and surface of such planet, the stronger will be the attractive force and consequently the more rapid the electrical flow to such planet, consequently the volume and rate of flow will be determined by such conditions as may determine the mass, the density, the surface, the electrical change and consequent renewal of electrical affinity within any planet for the electro-vital force of the sun.

As the affinity upon the surface of any planet is being constantly satisfied upon that side of such planet facing the sun and by virtue of such union of electrical forces, such planet is caused to rotate such electrically satisfied portion of such planet away from the sun, and in so doing rotates to the sun a new surface possessing a like unsatisfied affinity as the previous surface now renewed through radiation; then it becomes evident that the attractive force existing between the sun and any planet of the solar system will remain constant, and that the flow of electro-vital force and the movements imparted to such planet by virtue of such electrical attraction and repulsion will become perpetual. It becomes evident that the attractive force of any planet for the sun's force will be largely governed by the readiness with which any planet is able to renew its electrical affinity for the force surrounding the sun.

CONDITIONS REGULATING A PLANET'S AFFINITY FOR THE SUN.

The electrical affinity of any planet will be largely governed by the conditions that regulate its electrical radiation. Among these are the density of the planet, the nearness of the planet to the sun, the presence of satellites that become influenced by electrical radiation from the planet and the mass of the planet so influenced. Thus a planet with great density like Mercury will incline to both receive and radiate electricity readily and consequently require but little time to become electrically influenced when rotated under the direct rays of the sun and to part with such electrical influence when its positive surface becomes rotated to a point opposite from the sun. Thus density facilitates a change of electrical affinity. The nearness of Mercury to the sun will incline to retard electrical radiation from the comparatively dense solar atmosphere through which the planet passes in revolving around the sun. The absence of satellites will also retard electrical radiation to supply such satellites. Thus both nearness to the sun and the absence of satellites will retard electrical radiation from a planet and its consequent change of affinity for the sun. If Mercury had a greater mass and the same density that she has, then her electrical affinity would be stronger and the readiness with which her negative surface would change to a positive surface as her negative surface emerges from dawn of day to full sunlight, would cause a more ready change in her electrical affinity and a consequent change in her electrical balance, giving her too much positive surface before reaching the zenith line, consequently the solar push exerted upon her positive surface would overcome the solar pull exerted upon her negative surface, which in turn would cause the entire mass to be pushed from the sun until an electrical balance would be reached, when the planet would find its rightful position relative to the sun and at that distance would become influenced by the forces that cause the planet to both rotate upon its axis and revolve within its orbit around the sun. Thus the renewal of the electricity of any planet will be largely governed by the forces and conditions surrounding the planet which by their presence either retard or facilitate electrical radiation. Thus a dense planet like Mercury, possibly without satellites or if present by their nearness to the sun and the consequent density of the electro-vital force surrounding such satellites that give but little demand upon the planet for such force and the comparative nearness of the planet Mercury to the sun causes it to be surrounded with an atmosphere comparatively rich in electro-vital force, which results in a comparatively slow electrical radiation of this force, consequently a comparatively slow renewal of its electrical affinity, resulting in a comparatively slow diurnal rotation. Yet such a state will result in leaving a more active, a more highly energized, a purer and a more wholesome atmosphere to enliven and vitalize all vital forms upon the planet, while the degree of heat will be only such as its mass is capable of producing on coming in contact with the electro-vital energy from the sun. Thus a greater degree of electro-vital energy will remain in a residual form within the atmosphere to overcome the otherwise vital sluggishness and vital torpidity and vital inactivity that would exist and become manifest upon all forms of animate existence, were conditions changed and the mass of the planet sufficient to more nearly neutralize the entire flow of electro-vital force from the sun,

With the planet Mercury the comparatively great density of its atmosphere with electro-vital force by reason of its comparative nearness to the sun and the absence of satellites resulting in a comparative slowness of electrical radiation and its consequent slowness in renewal of electrical attraction for the electro-vital force surrounding the sun, is in a measure compensated by the increased density of its mass, which will give to the planet an increased readiness of electrical radiation and its consequent increased readiness in the renewal of electrical affinity for the sun, as such electrically satisfied surface is rotated apast the electrical antipode to its zenith line, such antipode being situated on the opposite side of the planet from its solar surface and corresponds to that position of such surface occupied at the hour of midnight.

If the electrical radiation of Mercury were not thus increased by an increased density of its mass, the diurnal rotation of the planet would be rendered slower and its nights correspondingly increased in length, while the atmosphere during long nights would incline to retain the heated state that it may have acquired during the day, which, if prolonged under conditions of great humidity, might possibly render the atmospheric heat intolerable, all of which is avoided by the increased density of the planet and the increased rapidity in electrical radiation and its consequent increased rapidity of renewal in electrical affinity for the sun's rays thus gained, thus rendering it possible for a high degree of residual electro-vital force within the atmosphere of the planet to be maintained at all times, with its consequent vitalizing effects upon all forms of life existing upon the planet.

On the other hand, Jupiter being surrounded with a number of satellites that modify her heat and cold, and being also surrounded with a comparatively rare atmosphere from a less solar electro-vital pressure, would very readily radiate her solar electro-vital force whenever her surface would rotate to the opposite from her solar exposure, which might result in a very much diminished electro-vital force being retained at night within her atmosphere, which might result disastrously to living forms upon the planet were this condition not compensated by the rarity in the density of her mass and the increased diameter of her mass, the former of which inclines to decrease the readiness of her electrical radiation while the latter inclines to increase her normal affinity for the solar electro-vital force, increasing her attraction and the consequent increase in the rate and volume of her solar-vital flow, all combining to modify her climate and to increase and to retain a higher degree of electro-vital force within her atmosphere, to produce more heat and to retain a higher degree of vitalization for all forms of life as may exist upon such planet.

Thus the great God of the Universe, who has created all things and placed the planets in their respective positions, has so provided that one condition shall compensate for any ill effect of another condition that the ultimate result of all shall be the promotion of life upon the various heavenly bodies of our solar system. Are we not justifiable in stating that to promote, cultivate and sustain life within the universe is the great object of creation and the living creature, created in the image of his Maker, possessing that combination of mind, matter and spirit capable of becoming in touch with the Infinite and of becoming, in nature, both generous and kind, in execuation both strong and capable, and, by being thus transformed, becoming, through the careful cultivation of all one's goodly attributes the very acme of creation—a masterpiece, whom our

Father delighteth to own. To such a generous God, may we not well give that service rightfully due Him, by an earnest endeavor to accomplish the mission of mankind to so utilize the many generous provisions in Nature to the ultimate good of God's creatures and to the increase of life and the promotion of happiness to all mankind and to dumb animals as well? In so doing, may not the many joyful songs of happy living creatures render unto God the most pleasing as well as the highest praise and through such may we not give the highest service to Him who has so generously entrusted us with the guardianship of His own creatures, both man and beast?

Viewing the forces that produce the movements of the heavenly bodies as we do, we are forced to regard the views of Isaac Newton, wherein he claims that heavenly bodies attract each other directly as their respective masses and inversely as the squares of their distances apart, as in error. Hence we discard the accepted law of Universal gravitation. The writer is led intuitively in thought to make the following predications concerning matter and its uses: That of itself matter is inert save for the inherent force that dominates its action; that matter receives its active inherent properties from the nature of the dominating properties of the force existing therein; that matter becomes the vehicle through which and upon which the dominating properties of the dominating forces manifest their dynamic properties; that matter becomes the medium through which the positive celestial force unites in atomic union with the negative terrestrial electrical force within the living cell to produce growth and all the varied material forms of vegetable and animal life upon the earth; that matter becomes the medium through which the positive electrical force unites in atomic union with the negative electrical force to produce all the varied forms of perceptible activities, either animal or inanimate, upon the earth; that any portion of matter upon the earth receives its weight from the mutual affinity existing between the forces existing within such portion of matter and the forces existing within its electrical antipode, situated within the electrical quadrant of the earth directly opposite the center of the earth from the electrical quadrant containing such portion of matter and connected by lines passing from every point within such portion of matter through the earth's center to similar points within the electrical antipode situated within the electrically opposite quadrant of the earth. (See Plates IV and XII.) Thus the electrical antipode is found by passing a line from such mass through the center of the earth to a similar position upon the opposite portion of the earth from which such mass may be situated. Electrical quadrants one and three are electrical antipodes to each other, while electrical quadrants two and four are electrical antipodes to each other, as shown in plates IV. and XII. Hence what is termed the weight of any mass is but simply the measure of the strength of the force of the mutual affinity existing between the force within such mass and the force within its electrical antipode, compared with the force of the mutual affinity existing between the force within some other portion of the matter taken as the unit of weight and the force within its electrical antipode. Hence the force of gravitation upon the earth is but the measure of the force of the mutual affinity existing between the force within the matter intervening between the center of the earth and its surface and the force of its electrical antipode within the matter lying upon the opposite side of the earth's center and intervening between the center of the earth and the earth's surface. Hence the force of gravitation existing within the mass of the earth is but the measure of the force of the mutual affinity existing between the forces existing within quadrants bearing the relation of electrical antipodes to each other.

As all lines must pass through the earth's center along which the mutual affinities existing between any portion of the earth's mass and its electrical antipode unite to produce the force of attraction existing between such mass and its electrical antipode, therefore the forces of gravitation always point to the earth's center from any portion of the surface of the earth. The writer is further impressed with the thought that what is regarded as the force of universal gravitation, whether existing upon the earth or between the earth and other heavenly bodies, or between any heavenly bodies other than the earth, is properly a force formed by a mutual combination of forces having a mutual affinity for each other, that, when mutually combined in atomic union, each force becomes capable of either wholly or partially satisfying the affinity existing within the other force. Hence by virtue of one or more of such forces existing within matter, the matter being attached and so influenced, is drawn in the direction of the other attracting force, hence the attraction between the masses composing different heavenly bodies. Hence as the electrical affinity existing between that electrical force peculiar to any mass, as the terrestrial electrical force which we have designated as the negative electrical force, and that force peculiar to the celestial realm which we have designated as the positive electrical force, are always mutual until during the process of atomic union the property of attraction becomes changed within each to the property of repulsion, we are led to the opinion that the force designated as universal gravitation is no more than that force formed by the combination of the mutual affinity existing between that force within and peculiar to all matter composing the mass in each and every heavenly body and the force designated as electro-vital force, peculiar to the celestial realm that has engaged our attention throughout this work. That whenever such affinity shall have become fully satisfied in any heavenly body its force becomes annulled when it ceases to attract, until such affinity is again renewed, when the force of the power of attraction will increase as such affinity within the planet shall increase during such renewal until the normal affinity of the planet shall become re-established. We are of the opinion that the normal affinity within all matter composing heavenly bodies varies directly as the mass in each heavenly body; further that the affinity within any planet constitutes its attractive force not for the mass that constitutes other heavenly bodies but for the electro-vital force drawn to and surrounding some larger heavenly body having a higher degree of electro-vital force surrounding it than surrounds the smaller heavenly body. The smaller body having a greater degree of affinity than the larger body will attract such surplus electro-vital force surrounding the larger body as may be required to render the degree of electro-vital force surrounding each body proportional to their respective masses and in so doing equalizing the affinity existing in each for electro-vital force. But electro-vital force has an attraction for the electrical force, having an unsatisfied affinity that may exist in any mass, consequently the mass of the smaller body possessing such unsatisfied affinity will be drawn toward the larger body having a more nearly satisfied affinity, while the electro-vital force required to satisfy the affinity within the smaller body will be drawn from the larger to the smaller body. Thus the electro-vital force surrounding the larger body and the mass within the smaller body will approach each other until they meet and such affinity becomes equalized between the two bodies, when the smaller body will cease to approach nearer the larger body.

As the affinity within the mass having the least degree of electro-vital force reaches out toward that heavenly body having a greater degree of electro-vital force, the electro-vital force surrounding the latter body will incline to flow toward that body having the greater degree of affinity. Thus the direction of flow with electro-vital force is always in the direction of that heavenly body possessing the greatest degree of affinity and from that body possessing the least degree of affinity for electro-vital force; while the direction of movement in planetary mass will be in the direction of such other mass as may be able to supply the electro-vital force required to satisfy the existing affinity within the heavenly body possessing such unsatisfied affinity. Thus the direction of travel with electro-vital force is from a body possessing a more nearly satisfied affinity for such force toward such other body as may possess a less nearly satisfied affinity for such force; while the direction of travel with matter is from the weaker to the stronger degree of electro-vital force, which is from the lesser to the greater body, until the normal affinity within the weaker body shall become satisfied, unless the electro-vital force necessary to satisfy such affinity can be decreased by radiation into space or to some lesser heavenly body, then the electro-vital force surrounding the greater heavenly body will begin to repel the lesser heavenly body and continue to do so until such lesser heavenly body shall reach a position in space wherein its degree of electro-vital radiation shall equal the flow of electo-vital force to such body, when the lesser body will cease to be further repelled.

The writer regards the affinity maintained within any heavenly body for universal electro-vital force as regulating its proper position within the solar system, or within any other system of heavenly bodies as well.

Most prominent among conditions that influence the affinity of any planet may be mentioned the volume, mass, density, the influence of satellites surrounding such planet, and the density in electro-vital force surrounding the planet. Thus a planet having a great volume with a relatively small density and mass will have an affinity that will become satisfied whenever it shall draw unto itself an electro-vital force sufficient for its mass irrespective of its volume. Consequently the density of electro-vital force within the atmosphere of such planet sufficient to satisfy its existing affinity will be comparatively rare when compared to another planet with an equal mass and a relatively small volume and a relatively great density. In fact, the mass in each planet being equal, their affinities will be equal and each will have an equal attracting power for electro-vital force, while the density of the force attracted within and surrounding each planet will vary with the density of the mass in each. Thus a body having a relatively greater density of mass will have a relatively smaller volume, when compared to another body with an equal mass but a relatively smaller density of mass and its mass occupying a relatively larger volume. Consequently the equal quantities of electro-vital force necessary to satisfy the existing affinity in each planet will be distributed within and surrounding each planet according to their respective volumes. Therefore the normal degree of density of electro-vital force in each planet necessary to satisfy the normal affinity of each planet is proportional directly to the density of each mass and inversely proportional to the volume of each mass.

The existing affinity within any planet is maintained and kept constant by its radiating power. That is, the flow of electro-vital force to and from a planet necessary to produce planetary movements is largely influenced by the readiness with which the planet receives this flow and the readiness with which it emits this force in the form of neutral molecules into the surrounding atmosphere to be again liberated in space.

Radiation will be facilitated by the increase in the density of a planet and retarded by the decrease in the density of a planet, as is shown by the readiness of land areas over that of water areas in the receiving, accumulation and radiation of heat from the sun. It will be further facilitated by the influence of satellites surrounding the planet and depending upon such planet for this electro-vital force, from which they receive a portion of their supply. It will be further facilitated by the relative decrease in density in electro-vital force within the atmosphere of the planet upon its unilluminated side from the source of supply. Thus the solar influence will incline to fill the space through which the planet Mercury moves with a more dense atmosphere of elctro-vital force, than the solar influence will fill the space through which any planet more remote from the sun may move in space around the sun.

Radiation is influenced, by the density of the planet, by the influence of its satellites and the decrease in density of the solar atmosphere, that decreases with distance from the sun. It is evident that the rate of electro-vital radiation maintains the rate of the renewal of affinity that is being constantly reduced or satisfied as the planet's electrical force unites with the solar electro-vital force to form neutral molecules and a consequent repellant force producing diurnal rotation, which, on being rotated to the unilluminated side of the planet, becomes broken and, each element separating, the planet's force returning to again renew its affinity while the solar electrical atom or force radiates into space, to be utilized by some satellite or to be returned to the sun to replenish the sun's supply. Thus if the conditions producing the radiating powers of a planet are such as to produce slow radiation, the affinity will be correspondingly slow, torpid and sluggish; with a slow diurnal rotation of the planet; but if they are such as to produce rapid radiation, the affinity will be correspondingly quickened, acute and active and receive the inflow of electro-vital force with greater avidity with a correspondingly quickened diurnal rotation of the planet.

Thus we reason, that the attractive force between the sun and any planet of the solar system, or between any two or more heavenly bodies, is not governed according to their relatives masses and their relative distances from the sun and from each other, but rather is governed by the force of the affinity maintained within and between any two or more heavenly bodies for each other; that the force of the affinity maintained between two attracting bodies is influenced by the conditions that increase or decrease the rate of renewal of the affinity of the force within the lesser energized body for the electro-vital force surrounding the more highly energized body. As the rate of renewal of affinity within any heavenly body is dependent upon the rate of radiation of electro-vital force from such heavenly body, in the process of attracting, satisfying the affinity and repelling such electrical atoms, which is dependent upon the mass, the density of the mass, the density of the solar atmosphere in electro-vital force, which is itself dependent upon distance from the sun and the number and nature of the satellites supplied by such heavenly body, it becomes evident that each heavenly body becomes a law unto itself subject to the conditions within and surrounding such heavenly body governing its rate of renewal and the force of the affinity established and maintained between it and the sun or any other heavenly body by which it may be influenced and with which it may be compared in an endeavor to secure an estimate of the attractive force existing between each. Therefore the writer does not undrtake to establish any law of attraction between heavenly bodies, but rather endeavors to set forth the conditions that govern and maintain the force of attraction between all heavenly bodies, leaving the discovery of any existing law, if any, to him who solves the various relations and forces surrounding each heavenly body that in any manner influence the force of the affinity maintained within and between each heavenly body for its central source of attraction and for each other.

Keeping these conditions in mind, let us consider their effect upon Mercury. Mercury is considered the nearest known planet to the sun. Its orbit lies some 35,750,000 miles from the sun, consequently the solar influence upon the space through which Mercury passes will incline to render the atmosphere, even on the unilluminated side of Mercury, rich in solar electro-vital force. In fact the solar influence will be more marked in rendering the space richer in electro-vital force than with any planet outside the orbit of Mercury. That is, the density of the electro-vital force surrounding the sun will decrease with the distance from the sun, consequently, as Mercury lies nearer the sun, Mercury will pass through space with a greater degree of density in electro-vital force than any planet lying outside the orbit of Mercury.

Mercury has no moon to draw electro-vital force from its surface. Considering the fact that Mercury passes through an electro-vital atmosphere compaartively rich with electro-vital force, when compared to such space or atmosphere surrounding planets more distant from the sun than Mercury, it becomes evident that when Mercury rotates its electrically positive surface, (having had its affinity satisfied as such surface was being rotated under the sun's rays) to the opposite side from the solar exposure and as such surface passes the electrical antipode of the zenith line near the hour of midnight, when such surface should become electrically negative, radiation is retarded by being overladen with an atmosphere comparatively rich in electro-vital force, the tendency being to hold the combination of the neutral molecules longer before breaking their combination and in so doing retarding the renewal of affinity within the planet. This condition might greatly retard the renewal of affinity within the planet and even to that extent of too greatly slowing the diurnal rotation of the planet, were it not for the fact that the radiation of the electro-vital force from the electrically positive surface of the planet is greatly facilitated by the great density of the planet, the density of Mercury being 6.85. Thus if Mercury had a less density her electrical radiation and the renewal of her affinity would be slowed, her dirunal rotation also would be slowed, which would incline to cause her electrically positive surface to be passed too far to the west of her zenith line, leaving the center of gravity to the eastward, causing such a large increase in the electrically positive surface of the planet to the westward of the center of gravity as to cause the planet as a whole to be repelled from the sun. But as the planet would continue to be repelled from the sun it would constantly arrive at that position in space where the solar density in electro-vital force would be as gradually becoming more rare, which would permit of a more rapid radiation in electro-vital force upon the unilluminated electrically positive surface of the planet, which would incline to increase the rate of renewal in the affinity of the planet, which would result in an increase in the rate of the diurnal rotation of the planet, which would incline to cause the electrically negative surface of the planet to pass further eastward during diurnal rotation, before the solar rays would cause such surface to become changed to an electrically positive state, which would as gradually cause the line of electrically positive surface of the planet to be carried nearer and nearer the center of gravity or zenith line, as the planet would be all the time receding from the sun, until that position would be reached in which the rate of radiation would be sufficient to cause that rate in diurnal rotation of the planet, in which the electrically negative surface would be carried nearer the zenith line and lie near upon or even slightly to the eastward of the zenith line before being made electrically positive, thus equaling the pull and push force exerted by the sun's rays upon the planet. At such distance from the sun the planet would find its proper electrical equilibrium and produce its movements both in its orbit and upon its axis in a manner as already described in this work under the description of the earth's diurnal and annual movements.

If the planet Mercury were more dense than it now is, 6.85, its rate of radiation and consequent renewal in electrical affinity within the planet would become increased, which would increase the rate of its diurnal rotation, which would cause it to become electrically negative more rapidly than it now becomes electrically positive, which would cause an increased electrical affinity for electro-vital force surrounding the sun, which would cause the negative surface upon the solar exposure of the planet to advance eastward, causing the planet to approach the sun, but as the planet would approach the sun the increase in the electro-vital force within the solar atmosphere would incline to retard the electro-vital radiation from the planet, which would slow the rate of renewal in the affinity of the planet for electro-vital force, which would retard the diurnal rotation of the planet as the planet would approach the sun, until the planet would arrive at that position wherein the rate of electro-vital radiation would become sufficiently slowed as to cause the electrically positive surface of the planet to recede westward until it would reach near or to the zenith line, wherein the electrically positive surface would equal or about equal the electrically negative surface of the planet's solar exposure, when the line separating such surfaces would lie over or near the line of the center of gravity of the planet. At such position the electrically positive and the electrically negative forces exerted upon the planet would reach sufficiently near that point of electrical equilibrium within the planet's mass, wherein the planet would find its proper electrical relation to the sun's force and would not approach nearer nor recede from the sun, until such electrical equilibrium should become disturbed or influenced in some way sufficiently to cause a change in the planet's rate of renewal in affinity and consequent relation to the sun. The planet would at this point become acted upon by the same forces and influences as to cause movements, both diurnal and annual, providing its mass is properly distributed, similar to the movements of the earth, both diurnal and annual.

Thus it is that the conditions regulating the electrical radiation of a planet serve to regulate the planet's normal affinity, by either slowing or increasing its rate of renewal, serving to effect the rate of diurnal rotation of the planet and to establish the proper distance of the planet from the sun, wherein the planet may maintain its diurnal and annual movements. similar to like movements upon the earth's axis and within its orbit.

THE PROBABLE CLIMATE AND SEASONS UPON THE PLANET MERCURY.

As we have already stated, we do not recognize Mercury as having any greater degree of heat upon her surface than the affinity within her mass is capable of producing when coming in contact with the sun's rays. We can only judge the probable climate and seasons of Mercury by comparing like conditions when applied to the earth. Mercury has a specific gravity of 6.85, while the earth has but 5.66. The diameter of Mercury is 2992 miles, while that of the earth is 7918 miles. The mean distance of Mercury from the sun is 35,750,000 miles, while that of the earth is 92,500,000 miles. Mercury revolves upon her axis once in 24 hours, 5 minutes, 28 seconds, while the earth revolves once upon her axis in 23 hours, 56 minutes, 4 seconds. Mercury revolves once around the sun in 87.97 days, while the earth revolves once around the sun in 365.26 days. Mercury has no moon, while the earth has one moon. The inclination of the ecliptic to a diameter to the earth's axis from the equator is upon the earth 23°27′40″; while the orbit of Mercury makes a farther incline of 7°0′8″, making 30°27′48″ inclination.

Holding these facts in mind, let us consider the conditions surrounding the planet Mercury that would influence her climatic conditions and the probable seasons produced from such conditions.

By reducing the mass of Mercury to the same specific gravity as the earth, we find that the volume of the planet would be raised to a diameter of 3621 miles. Thus the heat-producing power of similar sections through the earth and the planet Mercury, under similar conditions, is about 2.18 times as great upon the earth as upon the planet Mercury. But we find that the earth revolves upon its axis in 23 hrs., 56 min., 4 sec., while Mercury revolves once upon its axis in 24 hrs., 5 min., 28 sec.; while the circumference of the earth is about 24,875 miles, the circumference of Mercury is about 9,400 miles. Thus we find that the surface of the earth revolves much more rapidly under the sun's rays than does the surface of the planet Mercury. By computing the above relations we find that the earth passes one mile of her surface under the zenith line every 3.46 sec., while Mercury passes one mile of her surface under her zenith line every 9.22 sec. Thus we find that Mercury exposes equal portions of her surface 2.66 times as long as does the earth to the direct rays of the sun. Thus we find that while the sun's rays may not be so intense upon the planet Mercury, yet she holds her surface to a longer relative exposure than does the earth to the direct rays of the sun. But Mercury has no moon, consequently the earth has the influence of the moon to modify the heat of her torrid zone and the cold of her frigid zones. Mercury revolves once around the sun in 87.97 days, while the earth revolves once around the sun in 365.26 days; but the ecliptic of the earth makes a distance upon the earth's surface 46°55′20″, while the earth is passing from its perihelion to its aphelion, which requires 182.63 days, while the ecliptic of Mercury makes a distance upon Mercury's surface of 60°25′36″ while Mercury is passing from similar points between her solstices within her orbit, which requires 43.985 days. By computing these relations we find that the earth passes 3242 miles of her surface under the ecliptic , in 182.63 days, making an average of 17.75 miles each day, that the ecliptic progresses over the surface of the earth; while with Mercury we find that the planet passes 1591 miles of her surface under her ecliptic in 43.985 days; making an average of 36.17 miles each day. Thus the planet Mercury glides within her orbit and passes so much more swiftly between the points of her solstices that the sun's direct rays pass over her surface at the rate of 36.17 miles per day, while the earth passes her surface under the direct rays of the sun at the rate of but 17.75 miles per day, while passing between her solstitial points, thus making the exposure of each mile of the earth's surface to the direct rays of the sun about 2.03 times longer than each mile of the surface of Mercury is exposed to the direct rays of the sun while passing between her solstitial points,. Thus we find that while the heat-producing power of the earth is some 2.18 times that of the planet Mercury, the time of exposure to each mile of the surface of each planet under the direct rays of the sun in passing the zenith line in each, while making their diurnal revolutions upon their axis,is upon the planet Mercury 2.66 times longer than the earth makes during a like exposure. This gives Mercury a less intense heat but a relatively longer exposure to such heat-producing power. This condition gives a summer season very similar to our summers in northern temperate zones upon the earth. But the earth exposes each mile of her surface near the ecliptic, during the passage of the earth from its perihelion to its aphelion or between the solstitial points, a relatively longer time by some 2.03 times as long as does the planet Mercury. So does she expose her surface subjected to winter influence to a relatively like longer period. But Mercury makes her revolutions around the sun in less than one-fourth the time that the earth makes her revolutions around the sun, which gives to Mercury the advantage of shorter seasons in which to make her changes from one extreme temperature to another, consequently the extreme of one season is inclined to become merged into the next succeeding season, which inclines to modify the extremes of either heat or cold upon the planet, thus giving to Mercury seasons of neither extreme cold nor extreme heat, which, with the relative nearness of Mercury to the sun, gives her an atmosphere richer in electro-vital force, capable of giving that stimulus to life that is partially experienced to a limited degree in the latitudes of our north temperate zone during the summer seasons upon the earth. The earth has the modifying influence of the moon, which Mercury has not, but Mercury has the cooling influence of a denser mass during her nights than has the earth. But the earth has the influence of a less dense atmosphere of electro-vital force to assist her radiating power, which assists to relieve during the night the excessive heated condition that accumulates during the heated portion of the day. Thus the intense heat of the earth is partially relieved during the night, which gives the earth a climate subject to greater extremes than upon Mercury, where the heat is less excessive and the atmosphere is richer in electro-vital force, where the surface heat of the planet is readily radiated during the night into the adjacent atmosphere, by virtue of the relatively greater denseness of her mass than the earth, yet this surface heat when radiated into the adjoining atmosphere is retained longer upon Mercury than upon the earth by virtue of Mercury having no moon to supply and being surrounded with a denser atmosphere in solar electro-vital force. Hence the surface atmosphere during the nights upon Mercury retains a great-surface of the planet is greatly facilitated by the great density of the planet, the density of Mercury being 6.85. Thus if Mercury had a less density her electrical radiation and the renewal of her affinity would be slowed, her dirunal rotation also would be slowed, which would incline to cause her electrically positive surface to be passed too far to the west of her zenith line, leaving the center of gravity to the eastward, causing such a large increase in the electrically positive surface of the planet to the westward of the center of gravity as to cause the planet as a whole to be repelled from the sun. But as the planet would continue to be repelled from the sun it would constantly arrive at that position in space where the solar density in electro-vital force would be as gradually becoming more rare, which would permit of a more rapid radiation in electro-vital force upon the unilluminated electrically positive surface of the planet, which would incline to increase the rate of renewal in the affinity of the planet, which would result in an increase in the rate of the diurnal rotation of the planet, which would incline to cause the electrically negative surface of the planet to pass further eastward during diurnal rotation, before the solar rays would cause such surface to become changed to an electrically positive state, which would as gradually cause the line of electrically positive surface of the planet to be carried nearer and nearer the center of gravity or zenith line, as the planet would be all the time receding from the sun, until that position would be reached in which the rate of radiation would be sufficient to cause that rate in diurnal rotation of the planet, in which the electrically negative surface would be carried nearer the zenith line and lie near upon or even slightly to the eastward of the zenith line before being made electrically positive, thus equaling the pull and push force exerted by the sun's rays upon the planet. At such distance from the sun the planet would find its proper electrical equilibrium and produce its movements both in its orbit and upon its axis in a manner as already described in this work under the description of the earth's diurnal and annual movements.

If the planet Mercury were more dense than it now is, 6.85, its rate of radiation and consequent renewal in electrical affinity within the planet would become increased, which would increase the rate of its diurnal rotation, which would cause it to become electrically negative more rapidly than it now becomes electrically positive, which would cause an increased electrical affinity for electro-vital force surrounding the sun, which would cause the negative surface upon the solar exposure of the planet to advance eastward, causing the planet to approach the sun, but as the planet would approach the sun the increase in the electro-vital force within the solar atmosphere would incline to retard the electro-vital radiation from the planet, which would slow the rate of renewal in the affinity of the planet for electro-vital force, which would retard the diurnal rotation of the planet as the planet would approach the sun, until the planet would arrive at that position wherein the rate of electro-vital radiation would become sufficiently slowed as to cause the electrically positive surface of the planet to recede westward until it would reach near or to the zenith line, wherein the electrically positive surface would equal or about equal the electrically negative surface of the planet's solar exposure, when the line separating such surfaces would lie over or near the line of the center of gravity of the planet. At such position the electrically positive and the electrically negative forces exerted upon the planet would reach sufficiently near that point of electrical equilibrium within the planet's mass, wherein the planet would find its proper electrical relation to the sun's force and would not approach nearer nor recede from the sun, until such electrical equilibrium should become disturbed or influenced in some way sufficiently to cause a change in the planet's rate of renewal in affinity and consequent relation to the sun. The planet would at this point become acted upon by the same forces and influences as to cause movements, both diurnal and annual, providing its mass is properly distributed, similar to the movements of the earth, both diurnal and annual.

Thus it is that the conditions regulating the electrical radiation of a planet serve to regulate the planet's normal affinity, by either slowing or increasing its rate of renewal, serving to effect the rate of diurnal rotation of the planet and to establish the proper distance of the planet from the sun, wherein the planet may maintain its diurnal and annual movements. similar to like movements upon the earth's axis and within its orbit.

THE PROBABLE CLIMATE AND SEASONS UPON THE PLANET MERCURY.

As we have already stated, we do not recognize Mercury as having any greater degree of heat upon her surface than the affinity within her mass is capable of producing when coming in contact with the sun's rays. We can only judge the probable climate and seasons of Mercury by comparing like conditions when applied to the earth. Mercury has a specific gravity of 6.85, while the earth has but 5.66. The diameter of Mercury is 2992 miles, while that of the earth is 7918 miles. The mean distance of Mercury from the sun is 35,750,000 miles, while that of the earth is 92,500,000 miles. Mercury revolves upon her axis once in 24 hours, 5 minutes, 28 seconds, while the earth revolves once upon her axis in 23 hours, 56 minutes, 4 seconds. Mercury revolves once around the sun in 87.97 days, while the earth revolves once around the sun in 365.26 days. Mercury has no moon, while the earth has one moon. The inclination of the ecliptic to a diameter to the earth's axis from the climes for an equally short duration to the cooling influence of heat radiation during a mild winter of like duration, each following alternately in their respective order. The short duration of each season inclines to cause the planet to carry the influence of the previous season into each succeeding season, which assists to prevent any great extreme of heat or cold belonging to any season throughout the year upon Mercury.

The nearness of Mercury to the sun as compared to the distance of the earth from the sun coupled with the fact of her reduced diameter will incline to give to the atmosphere of Mercury a much greater residual solar electro-vital energy than the atmosphere of the earth contains, consequently the atmosphere of Mercury is more vitalizing to both plant and animal life than is found upon the earth. This fact renders animal life much more pleasant and her heat much less oppressive, even upon her torrid zone, than is found near the equator of the earth, or upon like latitudes more remote from the equator of the earth.

When we consider the fact of Mercury being exposed for a much less length of time during each season to either extreme, let that be heat or cold, with the extreme of the one inclining to modify the extreme of the next succeeding season, and further consider the highly vitalized state of her atmosphere, even along her equatorial climes, enriched to a high degree with solar electro-vital energy, we are led to the thought that the planet Mercury may be an abode for mankind to enjoy a higher form of physical existence than they are enabled to enjoy upon the earth. It is very probable that Mercury, hitherto considered, by so-called scientists, a highly heated or molten mass, is instead a planet with seasons freed from extremes of cold or heat, with mild temperature and a highly vitalized atmosphere, such as to render it a very paradise for such of God's creatures as may have developed a proper affinity of soul and proven themselves, in previous states of human existence, of sufficient worth to gain access to her delightful climes, that are doubtless interspersed with beautiful streams, gently rolling plains, fertile valleys, pleasant hills and gorgeous mountain sides, wherein they are permitted to breathe her pure highly vitalized solar energized atmosphere, to drink of her pure refreshing waters, to partake of the abundance of her varied vegetation, to enjoy the bounties of her fertile soil, to survey the beauties of her landscapes fragrant with the bloom of her abundant flora, containing every variety of needful vegetation requisite to the greatest comfort and most ample needs of mankind. In such a pleasant clime the weary may truly find rest. Thus it appears that the great God of the Universe, so kind and so generous, has formed and surrounded the planet Mercury with such a combination of conditions as to render its climate a most delightful abode, a very paradise for those whose innate affinities have given them a rightful habitation thereon. Shall I say for those who, in some former state of human existence have sacrificed selfish pleasures for the sake of the good of mankind, who have earnestly sought to raise those in more lowly stations to a higher plane of human existence, who have fed the hungry, clothed the naked, have soothed the bruised, cared for the sick, have comforted the broken-hearted, who have thrown off every motive of selfishness that in any way became an insulation between self and the principles of Christ, until their natures became one with Christ, filled with fixed principles that gave them a common affinity with the principles of the love of God as given to the world in Jesus Christ? Shall we say that it is but natural for such a spirit when separated from the mortal body at death, being freed by its Christlike nature from all selfish ties that would bind it by natural affinity to this world wherein it shall have accomplished its earthly mission for good, to be drawn by natural affinities to a higher realm of usefulness, comprehension and consequent enjoyment of the many wonderful provisions of a kind and loving Creator and common Father to all mankind, wherein He becomes a common father to the universal brotherhood of mankind? Shall we not say that in order for any one to receive the benefit of Christ's mission on earth that the actuating principle of that nature must be changed to a Christlike nature of unselfish love, wherein it becomes the representative of Christ on earth to raise mankind from lowly stations to a higher comprehension of the many wonderful provisions that God has made for mankind, wherein all may utilize and enjoy and receive unto themselves the fullest fruitage of a life transformed by Christ from selfishness, ignorance and general discord with God and Nature to one of self-sacrifice, higher comprehension and harmony with God and Nature and in so doing the natural desires and affinities of the soul become changed from discord to harmony with God as manifested in all Nature, whose visible manifestations become additional evidence to the promptings of the spirit that God is ever present, although incomprehensible? Shall we not say that it is but natural for any spirit having its actuating principle unchanged from selfishness to self-sacrifice, from discord to harmony with Nature and God, from brutal hatred to love and mercy for mankind to continue to reject such influences for good when death shall have separated the spirit from the mortal body and in so doing but manifest its own affinity for evil; consequently from lack of natural inherent forces it will continue to reject all influences that draw to other realms of higher usefulness, comprehension and consequent enjoyment of a higher rational existence and co-ordination in every human effort for good with God in Nature? Are we not justified in concluding that the mission of Christ is to change the actuating principle and consequent affinity of man from a state of discord to one of harmony with

God, wherein each force may jointly co-ordinate to the ultimate good of all mankind and the ultimate victory of good over evil and the ultimate consummation of God's unceasing effort to bring mankind into such states of higher usefulness and a more intelligent comprehension of the great harmony in Nature working through the unceasing intent of God for the ultimate good of all mankind and that, without this great work of Christ in bringing the actuating intent and consequent affinity of the soul into states of harmonious action with God through Nature to the ultimate good and higher welfare of all mankind, man must remain in a state of discord with God and Nature and consequently fail in receiving unto himself the realization of the many wonderful provisions of a beneficent and kind Creator and Father filled with an unceasing actuating principle of love that reaches out for the highest welfare of every human being? Yet the principles of God are fixed and unchangeable, absolutely absolute in principle, with a delicacy of repelling discrimination against antagonistic elements and with as equally delicate affinity for reciprocating elements, wherein the cup of blessings is filled to its utmost for him who opens his heart, mind and soul to the wooings of God's love. As bread will not be leavened unless the yeast plant receives those elements necessary to its growth, so will the human heart fail to leaven and fill with God's love unless the Holy Spirit shall receive the proper conditions within the human heart conducive to the reception, nurture and unalloyed action of the Holy Spirit. So absolute are the laws of God that every creature is alike subject to natural laws, nor does He abrogate a natural law for any influence whatsoever. Not even for Christ's sake would he permit that which He would not permit the most lowly creature under similar conditions to do. Had Christ violated the principles that gave to Him his power, He would have failed and become as any creature violating similar principles that separate man from the great source of power in God. God is no respecter of persons, but a respecter of and an adherent to fixed principles absolutely absolute, to deviate from which would destroy the absolutism of God and give to Him the vacillating passions and weaknesses of man. God does not from any cause wink at sin and discord, nor does He even for Christ's sake approve of or accept the heart of any man that does not make a complete unconditional surrender of every affection for evil and place its whole affection upon the principle that seeks the highest welfare of the human race under the direction of the spirit of love that takes possession and fills the human heart freed from all principles antagonistic to the love of one's fellow man, which love principle is of God and from God, presented by Christ to the comprehension of mankind, whereby he may lay aside every affection for evil and bare his inner being from all affections that antagonize the spirit of God and reach out and love God for His goodness to mankind, the means of receiving and the practical application of this love being presented to the world through the personal life and teachings of Christ.

Man thus first loves God and becoming filled with God's love through a complete surrender and negation of every principle antagonistic to good principles, becomes filled with a love that ends not in God but reaches out in love to seek the highest welfare of his fellow being. Thus man becomes filled with love from God that reaches out in love for the highest welfare of the lowly and oppressed creatures in life. He finds himself filled not only with love but an ardent desire to do something to better the condition of his weaker fellow being and to view with compassion and mercy the weaknesses and frailties from ignorance in his fellow being. He finds that he not only loves God, but he loves his fellow man and seeks to alleviate all pain and distress, whether in man or beast. Such love seeks the highest good of every creature. Such love is from God and fills the heart in harmony with God. Mankind are brought into a comprehension of this love through Christ. "We love him, because He first loved us. If a man say 'I love God' and hateth his brother, he is a liar: for he that loveth not his brother whom he hath seen, how can he love God whom he has not seen? And this commandment have we from him, that he who loveth God love his brother also." 1 John 4:19-21.

Hence we reason that the mission of Christ is to bring mankind not into a relation wherein God will pass over or wink at their sins, but rather into a relation wherein man loses his affection for that which separates and insulates the spirit of man from the spirit of God, and man is caused to love the good and become actuated for the common good and highest welfare of all mankind. Through this love principle man becomes the instrument of God in carrying His love through Jesus Christ to all mankind and through becoming in touch with God through a comprehension of God's love through Jesus Christ, and through an unconditional surrender of all affection for sin, man's inherent evil nature becomes transformed to an actuating principle of good will for all mankind and, becoming actuated through the love of God in the heart, man seeks to bring others into a realization of this new found relation with God and to bring the lowly into higher states of human enjoyment and into a fuller comprehension of God's love to mankind.

Man being thus transformed through Jesus Christ from an actuating principle of evil to an actuating principle of good, becomes changed in inherent affinities for evil to inherent affinities for good and thus naturally becomes drawn to higher realms of human existence, when death separates the spirit from the mortal body. Such appears to the writer the rational view of Christ's mission upon earth to sinful man. Hence the mission of Christ is more properly a psychical change of attitude in man toward God and mankind in which man's affections, desires and propensities become changed; from evil to good; from selfishness to self-sacrifice; from love of self to love of others; from destructive principles to constructive principles; from degrading others to uplifting others, from human oppression to human liberty, from an ignorant hatred for humanity to a love for mankind, from a superstitious idea of God being filled with enmity and hatred to a higher comprehension of God's love for every human creature, from a feeling of antagonism with God to a feeling of coordination in every human effort with God for the ultimate good of mankind. Thus the true mission of Christ is to bring man into, not only a comprehension, but also into an actual possession of God's love in the human heart, transforming the heart from affinities and affections for evil to affinities and affections for good; from selfishness to self-sacrifice with the affinities seeking the highest good for all mankind, from antagonism to coordination with God in every human act effecting the welfare of mankind. Yea truly! "Eye hath not seen, nor ear heard, neither have entered into the heart of man, the things which God hath prepared for them that love Him." 1st Corinthians 2:9.

THE PLANET VENUS.

The orbit of Venus lies between the orbit of Mercury and the orbit of the earth. Venus revolves once around the sun in 224.7 days. Venus revolves once upon its axis in 23 hrs., 21 minutes and 7 seconds. Venus is less eccentric in her orbit than Mercury, consequently the densities of the hemispheres of Venus must be more nearly equal than are the densities of the hemispheres of Mercury, and less nearly equal than the densities of the hemispheres of the earth.

The orbit of Venus inclines to the orbit of the earth 3°23′35″, being less inclined than the orbit of Mercury to the orbit of the earth. The density of Mercury is 6.85,the density of Venus is 4.81; that of the earth is 5.66. (The unit of density being the greatest density of pure water, which is reached at a temperature of 39.2°F or 4°C., which represents the temperature of water where crystallization begins preparatory to freezing.) The mean distance of the orbit of Venus from the sun is approximately 66.75 millions miles. The mean diameter of the planet Venus is 1-425,000ths of the mass of the sun. As Venus passes between the sun and the earth, the brightness of the sun inclines to obstruct the view of the planet while Venus is near the points of her conjunctions. The better views of the planet being at times when Venus lies at or near her points of greatest elongation; consequently not so much is known of the surface of the planet Venus. Yet from what can be ascertained concerning the planet Venus, scientists are of the opinion that Venus has an atmosphere with a higher refractive power, consequently denser than the atmosphere of the earth. Venus has no satellite, while the earth has one satellite, the moon. As the ecliptic varies from the ecliptic of the earth but 3°23′35″ and she like the earth revolves both upon her axis and around the sun at regular intervals, we assume that the axis of Venus is alike influenced and points to the celestial center like the axis of the earth and that she is alike influenced as the earth by the same forces in the production of her movements as the earth is influenced in the productions of its movements; consequently we will not enter into a discussion concerning the application of forces that produce the movements of the planet Venus, but we assume that the application of universal electro-vital force to the planet Venus is similar and productive of the same movements, both diurnal and annual, as the application of this same force in the production of the movements of the earth, both diurnal and annual. We therefore pass the consideration of the diurnal and annual movements of the planet Venus and pass to the consideration of the production of heat upon the planet Venus and its consequent effect upon the climate of the planet.

The diameter of the planet Venus, when reduced to the same density as the earth, is but 6,511 miles. By comparing the relative depth of the mass influenced in each planet by the sun's rays, the earth is greater by 1.21 times that of Venus, consequently her heat production is alike greater by 1.21 times that of Venus. But the earth exposes one mile of her surface while passing under the zenith line 3.46 seconds to the direct rays of the sun, while Venus exposes a like surface under like conditions 3.49 seconds. This gives the times of surface exposure to the direct rays of the sun as about equal on each planet, still leaving the heat-producing power of the earth the greater by almost 1.21 times that of Venus. But the earth exposes each mile of her surface, while her ecliptic passes from 23°27′40″ on one side of her equator to a like distance upon the other side of her equator while the earth is passing between her solstices 1.8 times as long as Venus exposes a like surface to the direct rays of the sun under similar conditions, that is, the ecliptic travels while passing from 23°27′40″ south latitude to 23°27′40″ north latitude while the earth is passing from her aphelion on June 21st to her perihelion on December 22nd, a distance each day of 17.75 miles upon the surface of the earth; while the ecliptic travels upon the surface of the planet Venus under like conditions and between similar points in her orbit, a distance of 35.9 miles each day. This still leaves the heat production and heat accumulation upon Venus less than upon the earth. But the earth has the influence of the moon to modify the extremes of her heat and cold and the more rare state of the earth's atmosphere in solar electro-vital force to assist in the radiation of the accumulated heat of the earth at night, while Venus has no moon to modify her heat and cold. Venus has also a less density than the earth, which serves to hold the heat produced during the day longer during the night than the heat of the earth would be likewise held, from the fact that a low density is inclined to retard the radiating power of any mass.

The influence of winter is carried to within 9°26′15″ of the equator upon Venus while it does not approach nearer than 19°37′ of the equator of the earth; likewise the influence of summer is carried correspondingly nearer the poles upon Venus than upon the earth. These conditions result in a greater modification of heat along her equatorial climes and in a greater modification of cold within the polar regions of Venus than upon the earth. The modification of extremes of heat and cold upon both the planets Venus and Mercury is compensated by the influence of the moon upon the earth's equatorial and polar climes, as has been already alluded to in this work, in giving the influence of the moon upon the earth.

Venus has shorter seasons than the earth, her seasons being about 56 days long, while the seasons of the earth are about 91 days long. This shortness of the seasons upon Venus, while it gives less time for heat to accumulate during the summer season, also gives less time for the winter season. This condition inclines to cause the extreme of one season to become modified by the extreme of the succeeding season, which results in a more moderate climate not subject to such extremes in either heat or cold as would be the case were the seasons longer upon Venus than they now are. The low density of the planet also inclines to cause the extreme of one season to be held longer to become modified by the extreme of the succeeding season, than would be the case were its density greater. These conditions coupled with the fact of the atmosphere of Venus being richer in electro-vital force than is the atmosphere of the earth, gives to Venus a much more delightful climate and a much more pleasant habitation for the abode of living forms than upon the earth. Thus the climate of Venus is doubtless far superior to the climate of the earth, making Venus a much more pleasant habitation for such of God's creatures as may be given access to that highly favored realm.

THE EARTH'S POSITION WITHIN THE SOLAR SYSTEM.

The earth is the third planet in order from the sun. The mean distance of the earth from the sun is about 92,500,000 miles. The inclination of its ecliptic is 23°27′40″ to a perpendicular to the earth's axis through the equator of the earth. The earth rotates once upon its axis in 23 hours 56 minutes 04 seconds. It rotates once around the sun in 365.26 days. The density of the earth is 5.66 times the density of pure water at 39.2°F, which is the point of the greatest density of water, which occurs just at the point of beginning crystallization preparatory to freezing. The mass of the earth is 1,326,800th of the mass of the sun. The earth has one moon, as already described in this work. The distance of the earth from the sun gives to the space through which the earth passes in making her revolution in her orbit around the sun a comparatively rare atmosphere in solar electro-vital force. This condition combined with the increased density of the earth over that of the planet Venus gives a greater radiating capacity and consequently a more rapid renewal in the earth's affinity for electro-vital force. These conditions would cause the radiating powers to exceed the rate of satisfying the affinity thus produced, which would cause the negative surface exposed to the sun to pass too far to the eastward before becoming electrically positive, which would throw the electrical balance in favor of the negative electrical force, which would cause the earth to approach the sun until such electrical balance would be reached that would produce a balance between the rate of electrical renewal and the rate of electrical radiation. Such condition would cause the earth to approach the sun to a position possibly relatively proportional to its density between the densities of Mercury and Venus, which would designate the rightful position of the earth relative to the sun, as between the planets Mercury and Venus and possibly distant from the sun about 53,833,000 miles. The earth would possibly take such position were it not for the influence of the moon over the earth, in reducing the rate of electrical renewal of the earth's affinity for the electro-vital force from the sun. This the moon does by transmitting the positive electro-vital force of the sun received by the moon, to the negative surface of the earth during nights preceding, during and following full moon and in so doing decreasing the terrestrial electrical affinity for the positive force of the sun when such surface is rotated under the sun's rays. Immediately at the period of the new moon, the negative force of the moon opposes the negative surface of the earth and assists to repel the earth from the sun. But just as soon as the moon glides into a position where the positive solar illuminated surface of the moon becomes exposed to the earth, then such positive force becomes reflected from the moon to the negative surface of the earth to combine with the electrically negative force of the earth and in so doing assists to reduce the electrically negative force of the earth, which reduces to that extent the terrestrial electrical affinity of the earth for the electro-vital force of the sun, which reduces the force of the solar pull for the earth to that same extent, when such electrically negative surface of the earth becomes rotated under the sun's rays. In so doing the intensity of the sun's rays becomes lessened to that extent and the moon has thus served to modify the intensity of the heat of the sun upon the earth. Thus by the moon's influence the normal affinity of the earth is reduced, while the negative surface of the earth is passing under the moon and consequently the heat-producing power of the earth is likewise reduced, hence the heat producing power of the earth on coming in contact with the sun's rays being reduced, the intensity of the sun's heat is likewise reduced upon the earth. Thus the intensity of the solar heat upon the earth is modified by the influence of the moon upon the earth, which indicates that the heat producing power of the sun upon the earth is lessened by virtue of the influence of the moon, consequently the heat producing power of the earth is not as great in proportion to its mass as is either of the planets Mercury or Venus, that have no moon to thus reduce their affinity and consequently reduce their heat producing power on coming in contact with the sun's rays. We are thus led to believe that the direct solar rays striking the earth do not utilize the full force of the earth's heat producing power and that a certain portion of the earth's affinity is annulled by virtue of the moon's influence over the earth as above indicated.

We are thus led to conclude that the heat upon both the planets Mercury and Venus is somewhat in excess of the relation that their respective masses indicate when compared with the mass of the earth. We are further led to conclude that by virtue of the moon's influence over the earth, that the earth is caused to take a position in space much farther from the sun than it would otherwise do if the influence of the moon were removed. Yet, if the influence of the moon were so removed from the earth, while the earth would take a position much nearer the sun, its equatorial heat and its polar cold would not be so modified as they now are, but each would be more intense, distinct and pronounced.

But, if the moon were removed from the earth and the earth would approach nearer the sun, the orbit of the earth would thereby become shortened and each season of the year proportionately shortened, which would result in the extreme of one season becoming modified by the approach of conditions producing the succeeding season, which on the whole would incline to modify the extremes of heat and cold upon the earth; yet, while the seasons of extremes in either heat or cold would be thus modified and the accumulation of heat and cold thus prevented to a great extent, nevertheless the earth would heat the more readily and part with its heat and accumulate cold the more readily during such shortened seasons and the extremes of heat and cold, although shortened during each season, would nevertheless become the more intense, distinct and pronounced, than they now are with the earth in its present position relative to the sun, with the moon serving as it now does to modify the extremes of heat and cold upon the earth, with the earth and moon in their present state relative to the sun and to each other.

THE SUPERIOR PLANETS.

The superior planets are those whose orbits lie outside the orbit of the earth. They comprise Mars, Jupiter, Uranus, Neptune and numerous minor planets.

Mars is the nearest to the earth of any of the superior planets. Mars revolves once around the sun in 686.98 days. The orbit of Mars lies at a mean distance from the earth of 141 millions miles. Mars rotates once upon her axis in 24 hrs., 37 mins., 23 sec. The mean diameter of Mars is 4211 miles. The density of Mars is 4.17 times the density of pure water at its greatest density, or .737th the density of the earth. Its mass compared with the mass of the sun is 1-3,093,500 of the mass of the sun. The orbital velocity of Mars per second is 14.99 miles; that of the earth is 18.38 miles per second; that of Venus is 21.61 miles per second; that of Mercury is 29.59 miles per second. The orbit of Mars is inclined to the ecliptic of the earth at an angle of 1°51′.02.28″.

The diurnal and annual movements of the planet Mars are produced by the same forces as the diurnal and annual movements of the earth. The ecliptic of Mars varying only 1°51′02.28″ from the ecliptic of the earth leads us to conclude that the planet is influenced by forces nearly identical as the forces that produce the annual movements of the earth; that is, the southern hemisphere is likely covered principally with water, while over the northern hemisphere of the planet, land prevails largely over the land area within the southern hemisphere.

Mars has two very small moons that revolve very rapidly around the planet and at comparatively very short distances from the planet. The low density of Mars would place her rightful position as between the planet Venus and the earth, were it not for the influence of her moons, which doubtless influence the affinity of the planet until it takes the position of 141,000,000 miles from the sun. The moons of Mars were unknown to the world until the year 1877, when they were discovered by Professor Hall, of the Naval Observatory. It is said that the satellites are only about six miles in diameter for the outer one and about seven miles in diameter for the inner one. Professor Hall found that the outer satellite revolved around Mars in 30 hrs., 16 min., and that the inner satellite revolved around Mars in 7 hrs., 38 min. The inner satellite revolves around Mars at a distance from the surface of Mars of only about 4000 miles. The distance that the outer planet revolves around Mars is not given in the text from which the writer secures his information concerning the satellites of Mars.

If the dimensions, times of rotation and distances given, concerning the satellites of Mars be true, it is very difficult to even approximate the probable influence that the satellites of Mars may have upon the climatic conditions that prevail upon that planet. Yet it does appear with one satellite revolving around the planet in 7 hrs., 38 min. and another revolving in 30 hrs., 16 min., that they will produce a commotion in the electrical state of the planet's atmosphere that may possibly result in great modifications to the climatic conditions of the planet, that might not otherwise obtain without such influence.

Possibly the moons of Mars serve to modify both the heat and cold upon the planet, or they may modify the climate in such a manner as to increase the normal heat producing powers of the planet. We do know that without such influence that the seasons upon Mars being much longer than upon the earth, would result in long, cold winters and summers correspondingly long, but not correspondingly hot summers, which would give to Mars under other conditions a very cold climate. The relative diameters of the earth and Mars, when Mars is reduced to the same density as the earth are, earth 2.55, Mars 1. Consequently the heat-producing powers as to mass will be earth 2.55 to 1 for Mars. But Mars passes her surface under the direct rays of the sun much slower than does the earth, consequently each mile of the surface of Mars is exposed to the direct rays of the sun relatively longer, making the exposure of equal surfaces upon Mars and the earth 1.877 times longer upon Mars than upon the earth. Yet this would still give the heat-producing power of the earth as the stronger. But we found that the influence of the moon upon the earth serves to modify the heat of the summer and the cold of the winter upon the earth, so that in fact we cannot determine just what the heat-producing power of the earth would be if its moon were removed, neither can we determine the influence of the moons upon Mars upon her climate. But we may rest assured that the same God that placed the earth and moon in the heavens and gave to the earth an inhabitable climate, has also placed the planet Mars and her moons in the heavens and in so doing gave to that planet an inhabitable climate. Let us rest assured that God's hand is found and his wisdom is alike displayed in the position and the conditions surrounding each planetary body and that God has not created anything for naught, but rather that life and conditions for happiness abound in every handiwork of God.

MINOR PLANETS, MINOR MASSES, BOWLDERS, COMETS, THEIR POSSIBLE FORMATION AND THE FORCES GOVERNING THEM.

Between the orbits of Mars and Jupiter, at a distance from the sun varying from 203 millions miles to 292 million miles, are situated innumerable smaller bodies called asteroids or planetoids, which constitute the minor planets. These bodies are variable in size from bodies possibly 400 miles in diameter to bodies possibly too small to be detected with the telescope. Their existence were unknown to the world prior to the year 1800. Since that time the number discovered has grown from year to year until several hundred of the larger ones are now known to exist. It is possible that many thousands and possibly millions of them exist that have not yet been discovered. Who knows but that between Jupiter and Saturn and between Saturn and Uranus, and between Uranus and Neptune, and even beyond Neptune, such minor bodies may fill the great space that exists between those major heavenly bodies?

The position of the minor planets led astronomers to look into that portion of the heavens for a major planet, which led to their discovery, the first being discovered in the year 1800. The position of the minor planets and their small size and great number led to the theory promulgated by Olbers, that the minor planets are but fragments of a major planet that through some force or process became disintegrated, giving to that portion of the heavens the fragments of such major planet in the form of the minor planets; hence the existence of the minor planets.

The writer is more impressed with a theory more in accord with the nebular hypothesis, yet it is not his purpose to undertake to account for the origin of the present state of any of the heavenly bodies, more than that they were formed under the guiding power and intelligence of God, the Creator of the universe. Yet, as the writer recognizes the guiding control and power of God in many of the minor achievements in life, that His influence and power is ever exerted in every constructive phase of life, leading to the immediate and ultimate welfare and happiness of mankind, the writer likewise sees the hand of God working through the laws of nature in the formation of the heavenly bodies for an ultimate purpose in preparing an abiding place for the propagation, cultivation and development of creatures who may intelligently recognize, receive and commune with the unseen spirit of God in Nature and felt in a fellowship of love with one's fellow being, seen only through the eye of faith, yet very perceptibly felt in that exultation of soul in love and good will to mankind and to God that must be experienced and realized through that communion of a kindred spirit in harmony with one's fellow-being and with God through a common bond of love, found only in that new birth of the spirit spoken of by Christ, St. John 3:5-8, that can be felt better than told by him who thus sweetly communes in spirit with his God.

If the minor planets, or if all planets for that matter were originally formed from nebulae, it appears to the writer that those material atoms, lying nearest to some great body, as the sun, from which they would receive a positive electrical influence, would become highly charged with a positive electrical force and by developing a repellent force would be driven back more distant from the sun, but as they were being driven back they came in contact with other material atoms less positive or more negative than themselves between which there would exist an electrical affinity that would cause all such electrical material atoms to adhere to each other and form a mass at least for the space of time required to develop a positive and a negative pole or surface. But the solar exposure would soon render the aggregation of material atoms now formed into molecules more positive than negative, which would cause such aggregation of molecules to retreat farther from the sun, all the while attracting more material atoms less positive than such aggregation, as such aggregation receded from the sun; all the while the solar exposure would incline to render the aggregation of molecules more positive, thus creating further recession from the sun and an increased accumulation of atoms into molecules and a consequent increase in mass to such aggregation of molecules. If, for any reason, by coming into space where the material electrical atoms thus drawn to such mass were more dense upon one side of the line of specific gravity than upon the other side, of such line relative to the sun, then one side having denser atoms than the other side would destroy such equilibrium, relative to the zenith line or line of specific gravity relative to such mass and the sun, and in so destroying the equilibrium would cause a shifting of the mass into another position relative to the solar exposure, which would cause the sun to continue to repel the positive surface exposure and to draw upon the negative surface thus newly exposed to the sun, which would at once result in a rotation upon and around an axis that would be formed transversely or nearly so to the sun's rays. The mass would now continue to rotate upon such axis formed. If the radiating power of such mass would now become sufficient to change the positive into a negative surface as rapidly as the solar exposure would be able to change the negative surface into a positive surface, as such positive surface would be rotated away from the solar exposure and the negative surface would become rotated under the solar exposure, then an equilibrium between the radiating and receiving electrical powers of the planet would have become established. The rate that the mass would renew its negative attractive force for electro-vital force and the force of the pull thus produced would constitute the force of the affinity for electro-vital force maintained within the planet, while the rate that the mass would receive the positive electrical force or the electro-vital forces and the repulsive force thus produced would constitute the repelling power developed by the solar rays against such mass. If the force of the affinity for the sun's rays would maintain within such mass through electrical radiation and accretion of negative nebular atoms would equal the force of the repelling power developed against it by contact with the sun's rays, then such mass, whatever its size, if sufficiently distant from the field of prevailing attractive influence of all other masses of matter, would have found its rightful position in space and would establish a field of prevailing attractive influence in space, from which it would attract all material atoms not already united into aggregations sufficiently large to establish and maintain a negative and positive electrical equilibrium and thus annul the attracting force of such mass, when such mass would continue to rotate upon its axis and become a distinct body or planet in space. But if such mass should not have found such an equilibrium between the electrical force radiated or the affinity maintained and the electrical force received, then such mass would recede farther from the sun, all the while adding to its mass from the nebular atoms attracted to its mass, until such mass would become sufficiently distant from the sun and the conditions surrounding such planet or mass would give to the radiating powers of the planet an equivalent in radiating power to the amount of positive electrical force received, when the planet would have found its rightful position in space and continue to rotate upon its axis and maintain an equilibrium between the rate of renewal of the affinity constantly maintained and the degree of the positive electrical force received, where under such conditions as produce this electrical equilibrium upon such planet or mass, such planet or mass would establish a field of prevailing attractive influence, wherein the planet would exert the prevailing attractive influence over all other heavenly bodies, the diameter of such field bearing such a relation to the mass of the planet as the field of prevailing attraction surrounding the sun should bear to the mass of the sun. Within such field of prevailing attractive influence the planet would continue to add to its mass from all nebular atoms within such field. But if in so doing the electrical equilibrium exerted upon such planet should become disturbed, or if for any other reason the electrical equilibrium should become disturbed, then the planet would move in that direction that would nearest conform to the prevailing electrical influence exerted upon such planet, until a state of rest would be again secured or conditions established wherein such movement would become perpetually maintained, as in the rotation of the planets within their respective orbits around the sun, as elsewhere described in this work.

Thus, while all planets may have become formed by involution from some nucleus starting in space from nebular atoms and may have found their respective distances from the sun and may have established their rightful respective positions in space, so may the minor planets represent aggregations of matter similarly formed that have been sufficiently distant from any major planet to not become attracted to such body before they had developed a field of prevailing attractive influence surrounding each in which they were able to maintain a higher degree of positive electrical density surrounding each than the prevailing attracting body was able to maintain at such distance from such major body, consequently such minor masses continued to secure their own electrical equilibrium and to add to their own mass and to recede from the sun, while possibly receding through space but poorly supplied with nebular atoms, until they finally reached a position in space sufficiently distant from all major planets and from the sun wherein they were able to maintain an electrical equilbrium and secure a field of prevailing attractive influence of their own in space, over which they have and exert the dominating influence over all other heavenly bodies, but within which their own movements, both axleary and orbital, are governed by the prevailing source of positive electrical force.

It is a well known principle in physics that the property of cohesion can be gradually suspended by the application of heat, and, by the continuous application of a sufficient degree of heat, matter may not only be reduced from a solid state to a liquid state but even caused to assume the gaseous state. In the gaseous state the property of cohesion has not only become removed, but another property, that of molecular repulsion, has developed and become active, in which each molecule repels all other molecules of matter. By cooling, the property of cohesion returns and repulsion is removed. Possibly it is such a change in the nature of the properties of matter, wherein electrical atoms and masses of matter incline to first attract, then after a time incline to repel each other. We thus see that any property of matter may become subjected to changes due to the application of some other force upon such matter. We also observe that while the property of cohesion may be present and act with great tenacity between molecules in very close proximity, yet such mass of matter on being broken loses the force of cohesion for other portions and fragments thus broken, leaving the force of cohesion active only between molecules closely united by atomic union. Anyone may observe this by taking any mass of matter having the property of brittleness and breaking such mass into pieces. They will then observe that while the molecules composing each piece individually possess the power of cohesion for all molecules within that individual piece, yet they have lost the property of perceptible cohesion for all molecules within another piece of such broken mass. Thus we observe that the property of cohesion perceptibly exists only between different molecules in close atomic union to each other and that any perceptible distance inclines to destroy the power of cohesion between molecules of different fragments of the same mass whenever such mass becomes broken into separate particles. Possibly every solid mass of matter carries with it an inherent force subject to a positive and negative electrical force that remains active as long as such mass is united in atomic union but whenever such mass becomes broken then each particle forms into separate electrical poles, negative and positive, that remain tenaciously active between the molecules of the same particle of matter, yet weakened but possibly imperceptibly active between the molecules of different particles of matter.

Thus in the process of solidification into solids from nebular atoms, certain portions of the heavens may have been richer in certain kinds of matter than in others, when a nucleus may have been formed of certain portions more susceptible to electrical action than other particles in the same region, when this nucleus may have attracted many other particles alike susceptible to electrical action, when such increased mass would soon become too highly electrically positive and be caused to start to recede from the sun. Possibly millions of other such masses would likewise form and start to recede from the sun in like manner. Many such masses would come in contact with each other and if the process of cooling had not gone too far for such mass to combine in molecular union then such masses would unite and incline to form themselves into a single mass as a single magnet with its negative and positive poles and attract such other particles and masses as may come into sufficiently close proximity to its electrical influence to be thus drawn. But with the nature of certain kinds of matter that melt only at very high temperatures, such particles as may have formed their own negative and positive poles and having cooled below the melting point have refused to unite with other masses that may have likewise cooled and formed their own electrical poles, yet such minor masses may have been drawn into such close contact as to be alternately attracted and repelled, within a space wherein neither mass was able to maintain a prevailing electrical influence, yet in that state they attracted and repelled each other, giving unto each the marks of such contact, until many such masses became greatly worn by constant erosion, until on coming into position of inferior conjunction to some major mass or planet they became drawn to and became part of such major body or planet, having a sufficient attractive force to overwhelm the electrical force of such minor body and to draw such minor body to the surface of such planet where such minor body lost its electrical identity and became a part of such major planet after which it became held to the surface of such major body by the attractive force exerted by the electrical antipode upon the opposite quadrant of such major body to that occuped by the minor body and which now holds such minor body in such close contact as to become a part of such major body.

As all masses attract electro-vital force from a volume in space proportional to their respective diameters, it will be seen that each will have an electrical density surrounding each proportional to the diameter of their respective masses, reduced to equal densities, that will decrease in density from their respective surfaces to the limits of their respective fields of prevailing attraction for electro-vital force. Should a mass enter the field of prevailing atraction for electro-vital force of another mass, it will be seen that each mass will draw electro-vital force from the space around each to supply the affinity produced by radiation of electro-vital force from the unexposed positive surface of each. As their drawing powers will be proportional to their respective masses, it will be seen that the larger body will become surrounded with a higher degree of intensity in electro-vital force than the smaller body. If the smaller body is able to draw a sufficiency of electro-vital force to supply the affinity produced by electrical radiation from its unexposed positive surface then there will be no attractive force for the larger body developed, to cause the minor body to be attracted to or repelled from the larger body. But if the minor body be not able to draw a sufficiency of electro-vital force to supply its demands, then it will draw from that source of supply most convenient to secure such supply. As the minor body now lies within the field of prevailing attractive force of the larger body, it will find at least a portion of its supply most conveniently from such larger body. But in reaching out to secure such electro-vital force as may be required to satisfy its affinity, the smaller body is caused to pass in that direction where it may find a greater degree of electro-vital force, and as such minor body is also drawing from the solar electro-vital force, the minor body will pass in search of such supply along a line that will determine the mean between the force received from the sun and the force received from the major body. If the minor body by moving in the direction of the major body is able to secure a sufficiency of electro-vital force to unite with that received from the sun to satisfy the affinity maintained within the minor body at all times, in other words finds a position of electrical equilibrium, then the minor body will cease to approach nearer the major body and, becoming a satellite to such major body, will be moved in obedience to the forces exerted upon such minor body from both the sun and the major body. But if such minor body should fail to secure a sufficiency of electro-vital force as it approaches the major body to satisfy the affinity produced within the minor body it would be unable to accumulate a degree of electro-vital force in excess of that maintained by the major body at the distance of the minor body from the major body, which would cause the minor body to approach the nearer the major body; but as it approaches nearer the major body it would all the time come into a higher degree of electro-vital density maintained by the major body, which would incline to check the rate of radiation of the minor body and reduce and slow its affinity for electro-vital force, this state will have a tendency to render the minor body the more positive electrically. The body will now act within itself as a positive body to that extent wherein its positive electrical force shall exceed the amount required to satisfy and annul its negative electrical force. If such minor body shall lie over the first or fourth quadrants of the earth, the negative electrical force exerted by the first or fourth quadrant, as the case may be, will incline to draw the minor body directly to the earth, when on coming in contact with the surface of the earth its positive electrical force will become neutralized at once by the earth's mass. But if the minor body happens to lie over either the second or third quadrants of the earth, then it will incline to remain from the earth slightly longer than if lying over the negative first and fourth quadrants of the earth, from the fact that the electrical repulsion from the positive surface of the earth will incline to repel the positive force gathered around the minor body, which will incline to cause the minor body to continue its movement over and around the earth until it becomes sufficiently drawn by the negative surface of the earth to cause the minor body to approach the negative first or fourth quadrants of the earth, which it may do by being drawn along a line not passing directly through the earth's center but along a line that deviates from the center toward the negative first or fourth quadrant of the earth according to the position of the minor body. Thus the minor body may reach the earth along a line that may pass through a positive surface and the minor body reach the earth and lie upon a surface of the earth that for the time may be also electrically positive, yet the positive minor body has been drawn to the earth by the force exerted by the negative portion of the earth within either the first or fourth quadrants of the earth. In such case the center of the earth, rather the center of terrestrial gravitation, will move sufficiently toward the position of such minor body to equalize the mass of the earth, now augmented by the addition of the minor body, so that the earth's mass with its contained negative and positive electrical forces shall be equally distributed around this new center of terrestrial gravitation and which now becomes the new terrestrial center.

If the nebular hypothesis be true and nebular atoms have been transformed into solid masses through electrical attraction and the distance of each mass from the sun has been determined by its affinity for the sun's electro-vital force, as the writer has endeavored to set forth in this work, then the celestial atmosphere may at some time in the past have been filled with millions of small bodies, each of which may have found a rightful position in space for a time and revolved upon its axis and established a field of prevailing attraction surrounding its center; but, during succeeding times when the larger planets had become formed and began their ceaseless march in space within their respective orbits, and possibly each of those many millions of smaller bodies were alike influenced by the sun's electrical force and began to move in obedience to the prevailing influence over each, when during the processes of such movements many such minor bodies would come into the position of inferior conjunction to larger bodies and the sun. Then during the transit of the smaller body, if such smaller body would pass into the position of attractive influence, or the major body would pass over the smaller body so as to cause the smaller body to be thrown into the position of inferior conjunction, in which the attractive influence, whereby the cylindrical volume of electro-vital force passing from the equatorial region of the sun to the larger body or planet, would overwhelm the smaller body, then such increased density in electro-vital force over that degree of electro-vital force proportional to the mass of such minor body would cause the minor body to become enveloped in an atmosphere exceedingly rich in electro-vital force and check its radiating, powers while thus enveloped, which would soon destroy the electrical equilibrium formerly established between the minor body and the sun and cause the minor body to become exceedingly positive, hence to be repelled from the sun in the direction of the line of repulsion exerted upon such minor body, which often may be in direct line with the major body. If so, then the minor body would be caused to start with great and increasing velocity in the direction of the major body, when, if the distance be not too great, and the minor body remain sufficiently long thus enveloped, under the influence of electro-vital force passing from the sun to the major body, the minor body would finally reach the major body and become a portion of its mass. Possibly many millions of rocks of various sizes have thus reached the surface of the earth and other planets in this way. Possibly the numerous bowlders scattered over many portions of the earth's surface have reached the earth in this way, rather than to have been carried by floes of ice during some glacial period or epoch as commonly taught at the present day in our geologies. Thus by many such rocks being situated in certain portions of the celestial atmosphere and many becoming enveloped within the electrical flow from the sun to the earth, many millions of minor bodies have been added to the earth's mass in ages past, while possibly many minor accretions to the earth's mass have been likewise made during changes of the earth's crust from numerous causes, as elevations and depressions, changes in water and land areas and the consequent influence of the same upon all localities subjected to such changes. Thus it is that many bowlders may be found at various depths of the earth's mass, many possibly having become imbedded by the force of impaction on coming in contact with a softened earth's crust and many others having been covered by subsequent changes produced upon the surface of the earth at various times. Many of these stones are worn doubtless by having been subjected to the impact of others while in the celestial atmosphere and subjected to many rebuffs from one another after they had reached that point in solidification wherein their cohesive force was annulled, as to one another, yet active within each other, giving rise to separate magnetized bodies, resulting in counter attractions and repulsions that inclined to wear away their surfaces from such contact until through the process of time they became drawn unto the earth's mass and now represent stones distinct from the earth's crust, yet bearing the marks of erosion. But if the larger body should move too rapidly and cause its cylindrical volume of electro-vital flow to pass from over such minor body and no longer envelop such minor body, with its electro-vital flow from the sun, before the minor body should reach such larger body, or should the line of electrical influence cause such minor body to take a direction that would cause it to miss the larger body, then such smaller body would pass by or fail in reaching the larger body and would be perceived only as a shooting star, or if of greater magnitude, as one of the minor planets, then such minor body would become a comet and fly through space before it could again gain an electrical equilibrium, when it would be seen and present the appearance of a comet and be known as such, while passing through space, through the time elapsing between its start and again regaining its electrical equilibrium in space. Let us undertake to conceive of the conditions that may produce a comet flying wildly through space, yet not altogether wildly, but rather subject to such unusual influences that may for the time being overwhelm and destroy the electrical equilibrium of such minor body and cause it to be hurled in space in obedience to such unusual forces as may for the time prevail over such minor body. As we have shown, the minor body is first caused to deviate from its orbit by becoming enveloped within the cylindrical volume of electro-vital force flowing from the sun to some major body, (See Plate XIV, Section two) wherein the minor body comes into the position of inferior conjunction to the major body and becomes overwhelmed with the flow of electro-vital force flowing from the sun to the major body and by virtue of such unusual condition the minor body loses its own electrical equilibrium and becomes wholly under the influence of the now unusual forces that may for the time prevail over such minor body. The minor body being overwhelmed with positive electro-vital force is caused to become the more positive, breaking the electrical equilibrium that has formerly existed and causing the minor body to become repelled from the sun along such positive cylindrical electrical flow now enveloping the minor body and flowing to the major body. But before such condition can be established the momentum with which the minor body may be traveling in space must first be wholly overcome before such minor body shall become wholly under the influence of the electrical flow to such major planet. It will be seen that the larger the minor body and the more rapid that it may be traveling in space the greater will be its momentum and the less rapidly it will incline to yield to the influence of the electrical flow that now overwhelms it. Yet such electrical flow will incline either to disturb or to destroy the electrical equilibrium of the minor planet and to render its movement subject to the resultant that may be formed between the force of the electrical flow to the major planet and the force of the momentum of the minor body. It will be seen that a great deal will now depend upon the time that such minor body shall remain enveloped within and subjected to the electrical flow from the sun to the major planet while the minor body may be making its transit, also upon the size and momentum of the minor body, also upon the angle at which the electrical flow from the sun to the major planet strikes the direction of travel and consequent momentum of the minor body. If the minor body be of sufficient magnitude to become a planet and the time of transit be short, then the effect upon the minor body will be felt principally in the electrical disturbance within its atmosphere and possibly in a more or less deviation from its regular course within its regular orbit, during which time the disturbed affinity within the planet will incline to right itself and the electrical influence will incline to cause the planet to assume its rightful position relative to the sun. Weather conditions upon the planet may be greatly disturbed, periods of extreme heat upon portions of the planet may be followed by great electrical disturbances, lightning, windstorms, hail and rain storms, cyclones, while unusual cold may follow after the minor planet has passed from the influence of the electrical flow from the sun to the major planet and unusual weather disturbances and conditions have been produced from such disturbed electrical equilibrium. But if the minor body be of small dimensions, then the force of its momentum will be the sooner and the more easily checked and it will incline the more readily to yield to the influence of the electrical flow that now envelops it. If the time of transit be prolonged by the possibility of both the minor and the major body traveling in the same direction, then the conditions are increased for the minor body to become either greatly influenced by the electrical flow or to become wholly under the influence of the electrical flow from the sun to the major planet. If the minor body be sufficiently near the major body after it has become influenced by the electrical flow to such major body, then the possibilities are that the minor body may be drawn into the major body and find a resting place upon such major body, as the many millions of bowlders upon the earth have done in ages past. But if the major body be more remote from the minor body and the direction of travel be such with each that the minor body while approaching the major body will be impelled in a direction that the major body may have passed over during the time intervening between the passing of the cylindrical volume of electrical influence to the major planet from over the minor body and the time that the minor body reaches the field of prevailing electrical influence of the major body, yet the minor body shall have passed into the field of prevailing electrical influence of the major body before such field shall pass from the line of direction pursued by the minor body, then, if the minor body is unable to attract unto itself a degree of intensity in electro-vital force in excess of that degree maintained by the major body at that distance from the major body, the minor body will be caused to deviate from its course and incline toward the major body and become attracted to such major body.

But if the degree of electro-vital force attracted to the minor body be in excess of that maintained by the major body at that distance from the major body, then the influence of the major body upon such minor body will become annulled and a neutral line become established between the two bodies, while the minor body will continue to pass onward in space and be seen either as a shooting star if close or possibly as a comet if distant, yet all the time seeking its electrical equilibrium in space, while overcoming the unusual conditions that have thus enveloped it and caused it to depart from its rightful position, relative to the sun or other controlling electrical force.

It will be seen that, during such time as the minor body may be enveloped by the flow of electro-vital force from the sun to the major body, that the minor body will become extremely electrically positive, which will incline to cause the minor body to be repelled from the sun, but the moment that the minor body shall become relieved of the positive influence from the cylindrical electrical flow from the sun to the major body, that moment the minor body will begin to radiate more electricity than it receives from the sun, yet the great surplus positive electricity acquired while under the influence of the electro-vital flow from the sun to the major body will cause the minor body to remain for a time too highly electrically positive to be maintained at the distance that it has now reached from the sun, consequently the time must sooner or later come, according to the mass and radiating powers of the minor body, wherein the minor body will radiate positive electricity and will become more negative than positive, when the minor body will begin to be attracted by the positive electrical force surrounding the sun. The minor body will now be impelled along the line of the direction of travel by its momentum and will also be attracted to the sun along the direct line connecting such minor body with the sun. These forces will produce a resultant that will determine the line of progress of the minor body, which, if not in direct opposition, will become a curve that will finally lead the minor body back to its rightful distance from the sun, providing such minor body does not fall within the attractive influence of some other body of the solar system, wherein the minor body will be caused to pass through an atmosphere with a greater density in electro-vital force than the minor body is able to maintain, when it will be drawn to or fall into the major body having the prevailing attractive force over such space. But if the minor body fails to encounter such conditions then it will be drawn back toward the sun in a curve produced by the resultant force exerted upon such minor body to a position in space wherein the electrical flow from the sun to such minor body will exactly equal its radiating powers and a consequent affinity will be maintained at all times for the positive electro-vital force flowing from the sun to such minor body, which will determine its relation in space relative to the sun and other heavenly bodies, to remain constant, until it may possibly again fall into the position of inferior conjunction to some major body, with an electro-vital force sufficiently strong to again wholly destroy its electrical equilibrium and surround it with such unusual electrical conditions that will cause it to again depart from its rightful position in space and become subjected to again wander in space without electrical equilibrium in obedience to dominating forces other than its own natural affinity until such time that such unusual conditions shall cease to dominate its course, when, in obedience to its own inherent forces, it will seek that position in space wherein it shall find its electrical equilibrium and become dominated by the forces of an affinity maintained through those conditions that prevail within and surrounding its own mass and in harmony with all natural forces throughout the universe.

We shall not undertake to say what the possible part of the minor planets may be, but doubtless each is supplied with a sufficiency of electro-vital force to enable it to take an important part and perform its allotted mission in promoting life upon its surface or elsewhere in space. Possibly, by their presence and existence in space, they render conditions possible through becoming satellites, for a greater distribution of life to exist and for the songs of happy creatures to be raised upon other heavenly bodies, in pleasing melodies of love, joy and contentment, that touch the chord of love in the bosom of Him who gave to all living creatures their being, and who considers the highest praise in evidence of His handiwork, the songs and melodies of love and joy and peaceful contentment from the individual being in creation, as the highest evidence that His work has been well done and is being properly appreciated through a genuine innocent overflow of rejoicing from every creature.

THE PLANET JUPITER.

The orbit of Jupiter lies at a mean distance from the sun of some 481 millions miles. The orbit of Jupiter lies at an inclination to the ecliptic of the earth of 1°18′41.37″. The mean diameter of Jupiter is about 86,000 miles. The density of Jupiter is 1.378, which is a little less than the density of the sun and is 0.2435 the density of the earth. His diurnal rotation on his axis is performed in 9 hrs., 55 min., 20 sec. It requires 11.86 years for Jupiter to rotate once around the sun. His orbital velocity is 8.06 miles per second.

Jupiter has four moons. The mass of Jupiter is 1-1048th of the sun. The volume of Jupiter is 1-1000 of the sun.

If all planetary bodies attract universal electro-vital force from a volume of space proportional to the diameters of their respective masses, then Jupiter will normally attract universal electro-vital force from a volume of space having the center of Jupiter for its center and reaching outward toward the sun for a distance bearing such relation to the entire distance between the centers of the two bodies as the diameter of Jupiter bears to the combined diameters of both sun and Jupiter, when both the sun and Jupiter are reduced to the same density.

From the above relation we find that Jupiter will attract universal electro-vital force for a distance from his center of approximately 41,914,000 miles. Thus the planet Jupiter will have the prevailing influence over that of the sun for a distance of about 41,914,000 miles. The neutral line between the sun and Jupiter will be found near the above named distance from the planet Jupiter.

Hence all bodies, as the satellites of Jupiter, that lie within a radius of about 42 million miles of Jupiter, will come under the prevailing influence of Jupiter and their movements will largely depend upon the influence exerted by Jupiter upon such bodies. Jupiter with his satellites will become a secondary system to the solar system, and Jupiter thus combined with his satellites as a secondary system will revolve around the sun. Thus the great mass of Jupiter is in all probability sufficient to draw unto the planet a sufficient degree of electro-vital force to enable the rising neutral atmosphere along his equatorial belt to flow upward similar to the neutral belt upon the sun in sufficient quantity to supply the satellites of Jupiter with sufficient electro-vital force to produce sufficient heat upon the planets to sustain life in various forms upon the surface of such satellites; while possibly a little distant from the equator of Jupiter to possibly near his poles, life may be sustained and various forms of life may be maintained and light produced upon the planet through the union of electro-vital force from the sun with the affinity of Jupiter, produced within Jupiter, by the constant upward flow of this force combined in neutral form along the equatorial belt of Jupiter.

Thus the great distance of Jupiter from the sun, the low degree of density of the planet and his immense size leads us to believe that Jupiter performs the function of a sun to his satellites and that Jupiter with his satellites becomes a secondary system to the great solar system. The question arises, if the major planets fulfill the capacity and function of a sun to the satellites of their systems respectively, then to what force is due the power to propel such secondary systems around the sun as the great central body to every such secondary system, within the solar system? The satellites of each such secondary system doubtless all revolve around their central body in planes that do not deviate far, if at all, from one general direction. Consequently the belt containing such planes will pass around the central body, as the planet Jupiter, and separate the surface of the planet in two approximately equal parts. The line passing through the center of such planet perpendicular to such plane will constitute the planet's axis. One pole of this axis will, we think, always point to the celestial center. The planet will now oscillate to and fro at regular periods over the plane of the planet's primary orbit, alternately exposing the poles of the planet to the influence of the sun.

The influence wielded over the planet by its satellites causes the electrical flow to pass directly along the plane connecting such planet to its satellites, which is usually near a perpendicular to the planet's axis. Such condition causes the electro-vital flow to such planet to become strongest along the planet's equator and decreasing in intensity from the equator to the poles. Thus the inherent influence of the planet over electro-vital force existing within the space controlled by such planet will be strongest along the planes near the planets equator and weakest along planes near the planet's poles. This condition will permit the solar influence to take hold of the planet's polar regions and wield the controlling influence over the planet's movements, producing a constant spiral movement over the plane of the planet's primary orbit, while a progressive movement is also produced as illustrated in plate XIII in this work. While the diurnal movement of the planet is produced similar to the production of the diurnal movement of the earth, the controlling influence being exerted nearer the poles of such planet than upon the earth.

THE PLANET SATURN.

Saturn revolves around the sun at a distance of 882 million miles from the sun. The inclination of the orbit of Saturn to the ecliptic is 2°-29′39.80″. The mean diameter of Saturn is 70,500 miles. The density of Saturn is .75 that of pure water at its greatest density, or .1325th of the density of the earth. Saturn revolves once upon his axis in 10 hrs. 14 min. 23.8 sec. Saturn revolves once around the sun in 29.46 years. The orbital velocity of Saturn per second is 5.95 miles. Saturn has eight moons. Saturn is noted for his rings along his equatorial belt.

Saturn has the lowest degree of density of any known heavenly body. Saturn reduced to the same density as the sun will have the prevailing influence over the sun, according to the relation existing between the diameters of the two bodies, for a distance of 36,400,000 miles from the center of Saturn. Thus Saturn may and doubtless becomes of the nature of a sun to his eight and possibly more satellites, as yet undiscovered. The Saturnian system is in all probability a secondary system to the great solar system.

The plane of the rings of Saturn lies in the same general direction and are maintained in the same direction throughout the orbit of Saturn. The rings of Saturn have been viewed from various positions as the planet revolves around the sun. While viewing the rings of Saturn from various positions it has been observed that when the planet rotates into a position where Saturn lies in a direction beyond the sun that the rings fail to transmit the light of the sun through them, and that at such times, only the outer edges of the rings appear as illuminated. From such failure of the rings to transmit light it is believed that the rings are not transparent to the sun's rays. In the text written by Professor Simon Newcolm of the John Hopkins University and Director Edward S. Holden of the Lick Observatory it is said that "It is now established beyond a doubt that the rings do not form a continuous mass, but are really a countless multitude of small separate particles, each of which revolves on its own account. These satellites are individually far too small to be seen in any telescope, but so numerous that when veiwed from the distance of the earth they appear as a continuous mass, like particles of dust floating in a sunbeam."

It is the belief of the writer that the rings of Saturn are produced by virtue of the extreme rarity of the planet's mass, giving to the planet the lowest density of any known heavenly body. The molecules of the planet not being held by cohesive force sufficiently strong to prevent them being easily carried upward by any force that produces an upward flow of the surface currents of the planet, or secondary sun. Thus it is as the electrical combination takes place between the electro-vital force attracted to the planet and the inherent electrical force of the planet forming new electrical combinations of neutral molecules, as before described in this work, and such combinations rising in greatest density and strongest from along the equatorial belt of the planet to supply the satellites of the planet, similar to the action of the sun as already previously described in supplying planets of the solar system, then it is that the semi-solid, rather the semi-liquid or possibly the semi-gaseous, state of the molecules that constitute the planet's mass are carried upward by virtue of the pull exerted upon the planet's substance by the upward flow of the electrical combinations formed into neutral molecules, the planetary atom of which having a two-fold affinity, one leg of which is exerted upon the planet's mass, the other combined with the electro-vital force to satisfy and neutralize such force, while the expansile force exerted through virtue of the heat produced at the point of such electrical union, and the attraction exerted by the planet's satellites causes an upward rising of such neutral molecules. Thus it is, in such upward flow of the neutral molecules thus formed, wherein one leg of the planet's affinity is exerted upon the electro-vital force thus combined and the other leg is exerted upon the planet's semi-solid mass to pull upward and to cause a semi-gaseous portion of the planet's substance to rise possibly for thousands of miles into space over the equatorial belt of the planet Saturn, that a ring around the planet is produced in such dense form as to obscure the light of the sun and to render such rings or belt practically if not wholly opaque. Thus it is that the rings of Saturn are formed, according to the views of the writer, and wholly in accord with the principles heretofore given as to the nature of this wonderful universal electro-vital force in its action upon the sun and other heavenly bodies throughout the realm of the universe.

THE PLANET URANUS.

Uranus floats around the sun in space at a distance of 1,774,000,000 miles from the sun. The orbit of Uranus is inclined to the ecliptic of the earth at an angle of 46′20.29″. The diameter of the planet is 31,700 miles. The density of Uranus is 1.28 times the density of pure water at its greatest density, and .226th the density of the earth. The axial rotation of the planet is not known.. The planet revolves once around the sun in 84.02 years. Uranus has four moons that are known to revolve around the planet. By reducing Uranus to the same density as the sun, we find that the planet will exert the prevailing influence over all electro-vital force within a scope of 56,136,700 miles from the center of the planet. Thus in all probability Uranus becomes a sun to its own satellites and performs the function of a sun to such satellites.

The writer is of the opinion that the force of the sun proper, the great center of the solar system, is exercised over the polar regions of the planet Uranus and in so doing wields a controlling influence over the planet which causes it to revolve in a secondary orbit, which, as shown in plate XIII, assists the planet to progress along its primary orbit around the sun. In all probability the planet revolves upon its axis in diurnal rotation from the force of the solar influence upon the planet, similar to the earth's diurnal rotation.

THE PLANET NEPTUNE.

The planet Neptune was not discovered until the year 1846. Neptune revolves in its orbit around the sun at a mean distance of 2,780,000,000 miles from the sun. The orbit of Neptune is inclined to the ecliptic of the earth at an angle of 1.46′58.75″. The mean diameter of Neptune is 34,500 miles. The density of Neptune is 1.15 that of pure water at its greatest density, and .204th the density of the earth. The axial rotation of Neptune is unknown. The planet revolves around the sun once in 164.78 years. Neptune is known to have one moon. Reducing Neptune to the same density as the sun and comparing their fields of influence, we find that Neptune exerts a prevailing influence over all electro-vital force and all masses within a radius of 85,800,000 miles from the planet's center. Thus Neptune in all probability performs the function of a sun to her satellite and possibly to many more satellites as yet undiscovered within her sphere of influence. The sun in all probability exerts its main influence near the poles of the planet, whereby the planet is caused to rotate upon its axis within its secondary orbit under the solar influence and progress around the sun upon its primary orbit as shown in plate XIII of this work.

THE MOVEMENTS OF MAJOR PLANETS AROUND THE SUN, SECONDARY PLANETARY ORBITS, APPARENT RETROGRADE MOVEMENTS OF MAJOR PLANETS EXPLAINED.

(See Plate XIII.)

In the study of the apparent retrograde movements and the explanation as given for such apparent retrograde movement, the question arose in the mind of the writer that what is usually regarded as a retrograde movement is in fact an actual retrograde movement and that such movements become essential in giving to each of these great bodies like Jupiter, Saturn, Uranus and Neptune seasons of moderate length upon such portions of their respective surfaces as may be suitable to support life upon such surfaces, thus giving to the inhabitants thereof seasons of moderate length and thus avoiding those great extremes that otherwise might exist with seasons of such extreme lengths as would exist had those planets but one primary orbit, as is usually attributed to them. Then too, if the major planets of the solar system have no other movement around the sun than simply the apparent straight movement in their orbits around them, the length of the seasons must be extremely long, so much so, that it is very doubtful if life exists upon their surfaces; that is, if they are to be regarded as receiving a sufficient force from the sun to enable them to receive both light and heat from the sun, to that extent that renders portions of them capable of habitation. The writer regards life as the acme of creation, for which all else has been created, therefore he reasons that the major planets must be alike habitable as with other bodies of the solar system. At least such bodies either exist solely as secondary suns to give forth the element of life to other smaller bodies that possibly encircle them, which are doubtless habitable and maintain life upon their respective surfaces, or they exist to maintain life upon their own surfaces or they possibly perform both functions. Possibly the major planets emit vital force to their satellites from certain portions of their surfaces, while on other portions they render life habitable upon their respective surfaces. Hence they may have smaller bodies similar to our moon, revolving around them and dependent upon them for vital and away from the sun. The moment the planet passes to the north of this plane that moment the electrical poles begin another change, the positive pole beginning to form around the constantly illuminated area now surrounding the south pole while a negative electrical pole will begin to form around the area of constant unillumination now around the north pole. These electrical poles will enlarge as the areas of constant illumination around the south pole and of constant unillumination around the north pole grow larger and stronger. The more rapidly changing denser northern hemisphere will now cause the northern hemisphere to part with its positive electrical force and its consequent push from the sun at a more rapid rate than the slowly changing less dense southern hemisphere will part with its negative electrical force. This difference in electrical change within the hemispheres respectively will cause the northern hemisphere to let go of its pushing force at a more rapid rate than the southern hemisphere will be caused to let go of its pulling force for the sun. This difference will cause the planet to be drawn downward approaching nearer the sun and nearer the equinoxial plane which it reaches at the winter solstice, which is equivalent to the position of the earth in its orbit on Dec. 22nd, being nearer the sun than it is at the time of her preceding solstice, equivalent to the summer solstice of the northern hemisphere of the earth on June 21st. Thus the planet swings in its orbit nearer the sun in coming to the position of the perihelion or northern solstice by virtue of the resultant between the force of the celestial pull, the planet's momentum and the pull exerted by the remaining negative electrical force in the southern hemisphere which is now beginning to be assisted by the electrical balance in the northern hemisphere being now thrown to the newly developing negative electrical force within the northern hemisphere.

Thus the planet reaches the solstitial plane, equivalent to the position of the earth on Dec. 22nd. The southern hemisphere near this point passes its electrical balance from a negative to a positive electrical force, which now begins to assist the celestial pull to keep the planet from the sun and the plane of the equinoxes. The planet by virtue of the resultant from the combined forces of the celestial pull to the northward, the planet's momentum to the westward, the solar pull upon the electrically negative northern hemisphere and the solar push exerted upon the now electrically positive southern hemisphere, all combining to cause the planet to swing to the westward, to the southward and upward, receding away from the sun as it passes now through the fourth quadrant of its orbit to the position of its vernal equinox upon its primary orbit, equivalent to the position of the earth on March 21st, the southern hemisphere increasing in positive force while the northern hemisphere is likewise increasing in negative force, the planet reaching the position of its vernal equinox with each hemisphere having reached its maximum electrical intensity, that of the northern hemisphere electrically negative and being pulled by the sun, while that of the southern hemisphere is electrically positive and being pushed from the sun, while the variation between these forces due to the difference in the density of the hemispheres combined with the momentum and the celestial pull forms a resultant force that varies with the electrical states of the hemispheres respectively to form a combination that produces an elliptical orbit not encircling the sun, but rather encircling an area over the sun and by successive extensions eastward, by its southern arc overlapping its northern arc, forming spirals encircling the planet's primary orbit, thus travels to the eastward and around the sun.

In order that the reader may the better comprehend, we will suppose that the path of the primary or supposed orbit of the planet passes through the plane, rather along the plane of the planet's equinoxes. We will suppose that a secondary revolution begins at the period of the vernal equinox, that it swings southward and eastward and back northward in passing through the greater arc of the planet's secondary orbit from its vernal to its autumnal equinox. The variation in the density of the planet's hemispheres will cause the planet to be carried under the influence of the slowly changing southern hemisphere farther southward and eastward while passing through its southern arc than it will regain back to the westward in passing through its lesser arc from the autumnal to its vernal equinox. The planet is carried nearer the sun and the plane of the primary orbit while passing through the northern arc than while passing through the preceding or southern arc of the planet's secondary orbit, this difference being due to the difference in the rate of electrical change made by each hemisphere of the planet, the less dense southern hemisphere causing a slower rate of electrical change than the more dense northern hemisphere of the planet, as has been previously explained in outlining the orbit of the earth. The principle of the difference in the density of the hemispheres of all planets holding good as well upon all planets as upon the earth, by virtue of the celestial gravitation causing the heavier hemisphere of any planet to gravitate nearer the celestial center, which within the solar system is to the northward. This difference being utilized to produce a difference in the southern and northern arcs of the secondary orbits and producing an eastward progress of the planet around the sun by virtue of such difference, as has been previously explained.

The difference between the amount that the southern arc passes to the eastward over what the northern arc retrogrades to the westward is the amount of the eastward progress that the planet makes during a circuit of its secondary orbit, in traversing its supposed primary orbit around the sun. We for sake of illustration will suppose that the planet makes a circuit of its secondary orbit in the same time that the earth makes a revolution around the sun. As it requires Neptune 164.78 years to make a single circuit around the sun, then, if one of her primary circuits is made during one year, it will progress eastward each secondary revolution as far as 164.78 is contained times in 360° which is 2°11′5″. We can readily conceive how that a secondary circuit would not mark out an ellipse but would lack 2°11′5″ in returning to the point where it had started from to take its secondary circuit; that is, if the celestial longitude upon the primary orbit is say 0° at the point where the planet left the primary orbit at the vernal equinox, in passing through the greater arc it will return to the autumnal equinox upon the primary orbit to the eastward and the planet will appear to progress to the eastward while passing through the greater arc extending south of the supposed primary orbit between the vernal equinox and the autumnal equinox, but when the planet passes the autumnal equinox she will pass to the north of her supposed primary orbit and make a general westward retrograde movement while passing through her lesser arc north of her supposed primary orbit from her autumnal equinox to her vernal equinox. But the lesser arc will not extend as far westward as the planet has traveled eastward during her passage through the greater arc, hence the planet will be brought back to her vernal equinox on the supposed path of the planet's primary orbit around the sun and fail to return as far westward by 2°11′5″; hence the 2°11′5″ will mark the real eastward progress that the planet has made upon her primary orbit during the passage of the planet through her secondary orbit from one vernal equinox to the next succeeding vernal equinox. Thus, by successive secondary circuits, the planet is carried around the sun, with Neptune making an entire circuit around the sun once in 164.78 years. We can easily comprehend how that by successive secondary circuits there will form a series of spiral loops, the distance between each spiral being the amount of eastward progress made by the planet during the passage of one secondary circuit.

Thus all the major planets may outline a similar course in making their progress around the sun, and by so doing give to each seasons of short duration, simllar to the earth's seasons, while at the same time the planets may receive the electrical force from the sun necessary to produce all the various changes, both diurnal and annual, that may be required to produce all the various movements of all such planets of the solar system. Thus all the major planets while traversing their supposed primary orbits around the sun may in so doing traverse secondary orbits, as just described, which enable the planets to undergo all the various change of seasons at short intervals, similar to the seasons of the earth;

while at the same time they are propelled through the electrical force received by communication with the sun and equalized through their celestial gravitation to the celestial center, all combining to give all the various changes necessary to produce both the diurnal and annual or secondary movements of the respective planets resulting in possibly all the advantages of shortened seasons, while by successive secondary or annual movements the planets are enabled, by the overlapping of the southern arc in excess of the retrograde movement made by the northern arc, to make periodic progressions upon their primary orbit around the sun, that collectively enable each planet to encircle the sun in an orbit, not as supposed in a continuous elliptical orbit encircling the sun, but rather produced by a sucession of secondary orbits that spirally loop upon the preceding secondary orbit, the progression of the progressive southern arcs overlapping and outdistancing the retrograde movement made by the retrograding northern arcs. Thus by successive progressive overlappings, the distance around the sun is covered in the time that each planet respectively makes a circuit of its supposed primary orbit around the sun.

Thus what may appear to scientists as a retrograde movement, which they have been unable to explain, save by the change supposed to be made by virtue of the changes in position of the earth in its orbit relative to the planet, the sun and some fixed star, may be in fact a real retrograde movement due to the progress of the planet in its secondary orbit as the writer has endeavored to explain.

Thus the remote planets upon certain portions of their surface may be inhabited and enjoy all the various changes of seasons peculiar to our earth or to other planets nearer the sun and receive all the necessary electro-vital force from both the sun and the celestial sphere required to make life pleasant and enjoyable both upon all their satellites and upon portions of their respective surfaces.

Let us rest assured that the great universe is not constructed at random, but rather with that intelligence that marks its Creator, our common Creator and Divine Father, with omniscience and omnipotence, Who, with a beneficence infinite in every detail has created all things and made them harmonize to the ultimate good of all His creatures, throughout the entire Universe.

EXPLANATION TO PLATES.

Plate I. Plate one is designed to represent the solar system in space traveling around the celestial center, the great center of the universe. It is the opinion of the writer that all masses within the universe gravitate to this great universal center, consequently the sun with all bodies within the solar system are alike influenced and, true to this influence, point the densest or heaviest portion of each mass to this great center of attraction. The solar system may be the electrical antipode to a similar system lying equally distant from the celestial center and along a line passing from the center of the sun through the celestial center to another sun bearing the same relation to its system that the sun bears to its system, hence the gravitation of all bodies within the solar system in the direction of the celestial center, but more properly in the direction of the celestial electrical antipode of the solar system. The sun, carrying with it all the bodies within the solar system, progresses 50.1″ each year upon the circle of its orbit around the great celestial center. At this rate it will require the sun approximately 25,868 years to make one revolution around the celestial center. The line ab represents a plane passing through the center of the sun perpendicular to a celestial radius passing through the center of the sun. The line cd represents the plane of the earth's orbit, including the plane of the ecliptic, and which at all times passes through the center of the sun and earth and divides the earth into two equal portions. The plane cd cuts the plane ab at two points in the earth's orbit, and at a distance from the sun of approximately 92,500,000 miles. These points are known as the earth's equinoxes. The hemisphere of the earth containing the most land is the northern hemisphere, as is shown in plate three, consequently the northern hemisphere is the denser and heavier portion of the earth. As the heavier portion, like the ballast of a boat, will always lie on that side nearest the source of greatest attraction, so will the heavier portion of the earth lie on that side nearest its greatest attraction, the celestial center.

Suppose that a line were drawn representing the central line of attraction or line of pull between the earth and the celestial center. This line will include a celestial radius passing from the celestial center to the north pole of the earth. It is evident, as the earth traverses its orbit around the sun, that the earth will constantly pass from one celestial radius to another celestial radius. Suppose that each celestial radius be extended in space from the celestial center through the earth to a plane represented by the line efg. It is evident that each such celestial radius as it enters the north pole of the earth will emerge at the south pole of the earth and pass onward to the plane efg. It is further evident that the celestial radius thus passing through the earth will form the earth's axis, or rather coincide with and include the earth's axis, at such moment as the earth passes that point in its orbit. Thus the earth making diurnal revolutions upon its axis will turn upon each such celestial radius as the earth makes its annual revolutions around the sun in traversing its entire orbit. It is further evident that the totality of the celestial radii thus included, while the earth is traversing its orbit, will form the lateral surface of a celestial cone, with its apex at the celestial center and with its base passing through the line efg. It is further evident that a line passing from the center of the sun to the center of the earth, while the earth is traversing its orbit, will outline a plane including such portion of the line cd as may lie between the center of the sun and the center of the earth, and that such portion of the plane cd will form the plane of the ecliptic. It is further evident that the plane of the ecliptic will cut the plane ab at two points of the earth's orbit. It will be perceived that when the earth arrives at such points upon the plane ab that the line connecting the centers of the sun and earth will lie perpendicular to the earth's axis and outline a line upon the earth's surface, during the diurnal revolution of the earth upon its axis, that will divide the surface of the earth into two equal parts, consequently such line will outline the earth's equator and coincide with the earth's equator during the diurnal revolution of the earth at each such points in its orbit. It will be perceived that rays passing from the sun to the earth will become tangent to the earth's surface along a line passing through the poles and over the earth between the poles and dividing the earth's surface from north to south into two equal parts. That portion facing the sun will be illuminated while that portion not facing the sun will remain unilluminated; consequently at these points in the earth's orbit all portions of the earth's surface have equal night and equal day, hence the term equinox, when the earth arrives at either of those points in its orbit, which it does on March 21st and September 22nd of each year. The point at which the celestial radius passing to e cuts the plane cd marks that point in the earth's orbit farthest from the sun, called the earth's aphelion; while the point at which the celestial radius passing to g cuts the plane cd marks the nearest approach of the earth to the sun while traversing its orbit, called the earth's perihelion.

Plate II. In plate two, the earth is represented traversing its orbit around the sun. It will be seen that the earth's axis at all times includes a portion of a celestial radius, that at each point in the earth's orbit the earth's movement places it in position where the earth's axis no longer retains the same celestial radius but falls into line with another celestial radius that coincides with the earth's axis. Thus the earth is in constant motion and at all points changing its position where the previous celestial radius no longer is included along the earth's axis, but the earth's axis constantly changes from the line of one celestial radius to the next succeeding point where a new celestial radius coincides with the earth's axis. In this way the various celestial radii that coincide with the earth's axis while the earth is making an entire revolution around the sun form the lateral surface of a celestial cone as represented in plate one.

The lines passing parallel with the earth's orbit and tangent to the earth outline the limit of illumination upon the earth, while the earth is passing through its orbit around the sun.

Each celestial radius if extended to the celestial center will terminate at the celestial center.

The line ab is tangent to the orbit of the sun and perpendicular to the celestial radius passing through the center of the sun. If a plane were passed through ab and extended to and through the earth at the periods of the earth's equinoxes, it would pass through the center of the earth and along its equator midway between the poles of the earth and rays of light from the sun would fall perpendicular to the earth's equator and tangent to each pole of the earth, while the earth occupies the positions of her equinoxes, on March 21st and on September 22nd of each year.

The earth is represented at the top of the plate occupying the position of the summer solstice of the northern hemisphere and the winter solstice of the southern hemisphere, which occurs on June 21st of each year. It will be seen that the south pole is not illuminated by the sun's rays at this position for a distance of 23°27′40″, while the north pole is represented as illuminated by the sun's rays for a distance of 23°27′40″. It will be seen that the line of illumination passes diagonally over the earth's surface from the limit of the unilluminated area surrounding the south pole to the limit of the illuminated area surrounding the north pole, making an angle with the earth's axis and the celestial radius, including the earth's axis at this point, of 23°27′40″.

At the bottom of the plate the earth is represented at the position of the winter solstice in the northern hemisphere and the summer solstice of the southern hemisphere. The areas surrounding each pole for a distance of 23°27′40″ are again outlined by the line of illumination, that surrounding the north pole being in constant unillumination, while that surrounding the south pole is being constantly illuminated, during all the time the earth is making a diurnal rotation upon its axis each day of 24 hours duration.

It will be seen that, while the earth revolves upon its axis, the line of illumination will outline the areas of constant illumination and of constant unillumination that alternate between each pole respectively, between the periods of the earth's solstices.

Plate III. In plate three the land and water areas, respectively, are represented upon the surface of the earth. It will be seen how the land area in the northern hemisphere preponderates over the land area in the southern hemisphere of the earth and how the water area in the southern hemisphere preponderates over the water area in the northern hemisphere of the earth.

It will be seen that but little land area is shown south of latitude 30° south. It will be seen that by far the greatest portion of all the land area of the earth lies north of the equator of the earth. Thus it will be seen how the heavier portion of the earth, represented by the land area, has gravitated toward the north pole, leaving the lighter portion of the earth's mass surrounding the south pole. The writer attributes this difference in weight of the earth's hemispheres as due to the attractive influence of the celestial center of the earth's mass. As the ballast of the boat sinks to the bottom of the boat and as the heavier portion of any mass in liquid form always sinks to the bottom or nearest to the atractive force so has the heavier portion of the earth's mass during its formation gravitated toward the attractive force existing within the celestial center for all the matter of the universe.

The beneficent influence of this variation in the weight and the variation in the rate of electrical change between the land and water areas of the earth due to this difference in the weight of the hemispheres of the earth is given in our description in the body of this work.

Plate IV. Plate IV is designed to illustrate how the earth is caused to rotate upon its axis. In plate four is shown the earth facing the sun. The spectator is supposed to be viewing the earth and sun from a position to the north of the earth and along the plane corresponding to the zenith line of the sun's rays upon the earth. It will be seen how the sun's rays fall perpendicular to the line of illumination, as shown in plate two, and perpendicular to the line passing through the earth's center from east to west. We will suppose that the zenith plane cuts entirely through the

earth. It will then fall perpendicular to the plane passing through the earth's center from east to west. The earth by the intersection of these two planes is divided into four equal quadrants. As the earth revolves upon its axis from west to east, it will be seen how the earth's surface is being constantly rotated under the sun's rays and apast the zenith plane. It will be further seen that the zenith plane cuts the earth's surface at a point corresponding to noonday upon its illuminated surface and upon a point corresponding to midnight upon its unilluminated surface. It will be seen how the earth's surface along the western view of the earth's surface is being rotated from darkness into the dawn and then into sunrise and finally under the full force of the sun's rays. Thus at 6 A. M. the surface of the earth emerging from darkness into sunlight and under the influence of the sun's rays remains under the sun's rays until 6 P. M., passing the zenith line at 12 M. At 6 P. M. the earth's surface passes from under the sun's rays into the shadow of the earth, passing the plane of the zenith line at 12 P. M. and again emerging from darkness into sunlight at 6 A. M. the following morning. The Electro-Vital Force radiating from the sun to the earth is represented as a positive electrical force carried in the sun's rays, while the earth is represented as containing a negative electrical force. If such be true, which the writer assumes to be true and has given in the body of this work innumerable proofs from the phenomena of nature in proof of such assumption, then the sun's rays being positive fall upon a negative surface of the earth as it is being rotated under the sun's rays at 6 A. M. As positive attracts negative so the positive electrical force from the sun attracts the negative surface of the earth and exerts a pulling force upon the earth's surface; but, as time rolls on, the affinity between the positive and negative forces ceases and changes to a repellent force as they each become electrically satisfied. We have assumed that the electrical balance has become reached at or near the zenith line as the earth's surface passes under the sun's rays at 12 M., after which time the solar electrical force exerts a repulsion for the positive surface of the earth. But, as the surface of the earth changes and becomes positive at or near the zenith line, the earth as a magnet becomes changed from positive to negative upon the surface of the earth opposite from the sun and corresponding to the earth's surface at the hour of midnight. We now have the earth as a magnet, with its negative electrical force lying to the westward of the zenith plane and with its positive electrical force lying to the eastward of the zenith plane. The earth being divided into four equal quadrants, denoting position only, quadrants one and four lying to the west of the zenith plane are and remain electrically negative; quadrants one and three lying to the east of the zenith plane are and remain electrically positive, while the diurnal rotation of the earth produces a constant electrical change in position of the earth's surface, passing all surfaces in succession from quadrant one to quadrant four during each diurnal rotation of the earth upon its axis.

Plate V. The object of plate five is to illustrate the causes producing the winter season. It will be seen that the earth is represented as occupying the positions of the solstices. The illustration near the lower edge of the plate shows the position of the earth in its orbit on December 22nd each year, while the illustration near the upper edge of the plate shows the position of the earth in its orbit on June 21st each year.

It will be seen in the lower illustration that the area surrounding the north pole is unilluminated by the sun's rays. This unilluminated area begins at the pole on September 22nd and extends farther each day from the pole until by the time the earth has reached its winter solstice the line of illumination has passed from the poles a distance of 23°27′40″, leaving the north pole wholly unilluminated for that distance from the north pole while the south pole is wholly illuminated for the same distance from the south pole.

It will be seen that since September 22nd the unilluminated area surrounding the north pole has not been exposed to the sunlight and consequently has not changed from an electrically negative state to an electrically positive state as areas near the earth's equator have done during each revolution of the earth on its axis, bringing the negative surface of the earth under the sun's rays each day; but, on the contrary, the unilluminated area around the pole has remained electrically negative, consequently, as the earth is a magnet and all magnets possess an electrically positive and an opposite electrically negative pole, the surface of the earth contained within all lines passing from the sun parallel with the plane of the ecliptic and striking the surface of the earth and when prolonged will emerge from the earth within the constantly unilluminated area surrounding the unilluminated negative pole, will remain electrically positive. As heat is produced, according to the theory of the writer, at the points of electrical union between the positive electricity within the sun's rays and the negative electricity of the earth, it will be seen that there will be no electrical affinity between the illuminated surface of the earth, contained within the lines named above and the sun's rays, consequently there will be no electrical union upon the surface of the earth over such illuminated area and consequently no heat produced, hence the phenomenon of winter occurring at this season of the year produced by the failure of the electrical forces within the sun's rays and those of the earth to meet and unite with the earth's surface.

The arrows indicate the direction of the electrical flow over areas of the earth's surface, where there exists a reciprocal electrical affinity between the earth's surface and the sun.

The same phenomenon occurs in the southern hemisphere during the season that the earth passes its summer solstice of the northern hemisphere on June 21st. Thus it will be seen that while one hemisphere is having its winter season the opposite hemisphere of the earth is having its summer season.

Plate VI. In plate six the application of the various forces that produce the earth's movements, both diurnal and annual, are shown.

At the position of the equinox occurring on December 22nd the earth is supposed to be passing through its electrical balance, from having a preponderance of positive electricity within its northern hemisphere to having the preponderance of an electrically negative state within its northern hemisphere and increasing in degree from the period of passing such electrical balance; while the southern hemisphere passes from a preponderance of an electrically negative state to a preponderance of an electrically positive state, as the northern hemisphere is making a like change electrically in the reverse order.

The earth will be acted upon by the following forces, by a slight pull from the celestial center; by a slight solar pull on the negative electrical pole of the earth surrounding the north pole of the earth; by a solar pull upon the negative hemisphere of the earth during diurnal rotation, as shown in plate four; by a like solar push upon the positive hemisphere of the earth during diurnal rotation as shown in plate four; by a solar push on the now positive pole of the earth surrounding the illuminated south pole; and by a pull exerted by the earth's momentum, which inclines to oppose the celestial pull exerted upon the earth at this point. The following resultants are produced from the foregoing forces. The celestial pull combined with the solar pull for the negative unilluminated pole is shown in the parallelelogram ABCD, giving the resultant DB. The solar pull exerted upon the electrically positive surface surrounding the south pole of the earth at this time combined with the force of the earth's momentum within its orbit will produce the parallelogram DEFG, giving the resultant DF. The resultants DB and DF will give the parallelelogram DFHB, giving the resultant DH. But, as the forces are not applied directly along the lines as shown, but the momentum as shown by DG is subject to a constant change in direction as the earth is deflected from its straight course, so will the resultant DF be subject to a like change deflecting toward the sun as the momentum of the earth is constantly resisted as the earth progresses in its orbit, consequently the final resultant DH will take the course shown in the curved line giving the curved resultant DH as the true course of the earth.

The writer realizes that the line Dc should run parallel with the line AB starting from the north pole of the earth. So should the line DE run parallel with the line FG and start from the south pole of the earth; but, as the center of the earth is a mean between the two poles of the earth, the writer has taken the center of the earth for a starting point for the lines DE and Dc making the common line EC as the mean line for the pull and push force of the sun exerted upon the earth.

The diurnal motion of the earth produced as indicated above and shown in the arrows 3 and 4, will, when combined with the momentum produced by the resultant D7H, produce a spiral movement, which the earth is constantly producing through space. Thus, if any point on the earth's surface be taken and its course followed through space while the earth is both revolving upon its axis and within its orbit, it will be perceived how a spiral augurlike course will be produced in following the course of such a point upon the earth through space as the earth traverses its orbit, revolving upon its axis.

Plate VII. Plate seven is designed to illustrate the constant electrical change that the earth undergoes while traversing its orbit.

It will be seen that the earth at the positions of its equinoxes shows, for the equinox occurring on March 21st, the south pole of the earth as being repelled from the sun, both at the south pole and along its surface south of its equator. As the southern hemisphere has been subject to constant illumination from September 22nd, it must now have become electrically positive and consequently is being pushed or repelled from the sun, while the northern hemisphere has been unexposed to the direct rays of the sun since September 22nd, consequently has become electrically negative and is being pulled by the sun's electrical force. It will be seen that the north pole begins to be illuminated constantly while the south pole begins to fail in receiving illumination from the sun's rays. This condition increases constantly until the earth reaches the position of the solstice occupied on June 21st. The new electrical state surrounding each pole respectively does not accord with the electrical state of the remaining portion of each hemisphere respectively, consequently the direction of the arrows are changed to show the direction of the force exerted upon the earth. After the earth passes the position occupied at its solstice on June 21, the line of illumination begins to constantly approach the poles. Yet the earth on passing its equinox reached an electrical balance, where the preponderance of each electrical force changed hemispheres. The northern hemisphere is now no longer more negative than positive but is now more positive than negative, so the southern hemisphere is now no longer more positive than negative but has changed to be more negative than positive. This condition now steadily increases, while the areas surrounding each pole are constantly waning until the earth reaches the autumnal equinox, when the northern hemisphere has become wholly positive and the southern hemisphere wholly negative. The moment that the earth passes the autumnal equinox the north pole begins to be subject to constant unillumination while the south pole begins to be subject to constant illumination from the sun's rays. An area of negative electrical force will begin to form around the north pole while an equal area of positive electrical force will begin to form around the south pole. This change is indicated in the illustration following the position of the autumnal equinox and shown in the direction of the arrows. The earth continues to move and the electrical areas continue to grow around each pole until the earth reaches its winter solstice on December 22nd, when an electrical balance is again reached, when the preponderance of electrical force changes within each hemisphere, the southern hemisphere now becoming more positive than negative, while the northern hemisphere becomes more negative than positive. The area of constant illumination around the south pole now begins to wane, while the area of constant unillumination around the north pole begins to likewise wane, this condition continuing until the earth again reaches its vernal equinox on March 21st, when the line of illumination reaches each pole respectively. The constant change is indicated by the lessened shaded portion around the north pole and the direction of the arrows pointing to each hemisphere of the earth.

Plate VIII. Plate eight is designed to illustrate the constancy of the electrical force existing between the sun and earth or any planet while the earth or planet is traversing its orbit around the sun. It will be seen that the constant movement of the earth makes a like corresponding movement in the change of its electrical position over the sun's surface. This state of change prevents the earth or planet from exhausting the electrical force upon any one portion of the sun's surface, but gives it a constant change to a new surface upon the sun, wherein the earth or planet receives the full electrical force of such new solar surface.

Another important feature, unintentionally omitted in the chapter explaining the features shown in plate eight, is the change produced by the constant rotation of the sun upon its axis, which rotating once upon its axis every 25 days, causes the sun's surface to pass under the earth or any other planet at the rate of 1 1-4 miles per second, 75 miles per minute, over 4,508 miles per hour, and over 108,070 miles per day. Thus the electrical reciprocal state between the earth or any planet and the sun is kept constant, not only by the change produced by the movement of the earth or any planet over the surface of the sun while the earth or planet is constantly rotating in its orbit around the sun, but is further facilitated by the constant rotation of the sun itself upon its own axis.

Plate IX. Plate nine is designed to illustrate the variation in the earth's mass influenced by the direct rays of the sun at different periods of the year; consequently the variation in the heat-producing power of the earth's electrical force on coming in contact with the sun's rays. Observation is made upon the northern hemisphere only. The same conditions is true for the southern hemisphere in the reverse order. It will be seen that on December 22nd the direction of the sun's rays fall from southward to northward, falling perpendicularly upon the surface of the earth over south latitude 23°27′40″. It will be noted on December 22nd that the sun's rays falling upon the tropic of capricorn would emerge, if prolonged through the earth, upon the opposite side of the earth at the tropic of cancer. It will be seen that the influence of the direct rays of the sun have not lost any in the depth of the earth's mass influenced, consequently the earth and sun being electrically reciprocal, nothing is lost in heat-producing power at that point. On the same date it will be seen at the equator that the direct rays of the sun would emerge, if prolonged through the earth, at 47°20′ north latitude, consequently the equator has lost in the depth of the earth's mass influenced since September 22nd, and consequently lessened in heat-producing power with the sun's rays at the equator. The same change will be observed for all points north of the equator after September 22nd to December 22nd. After December 22nd the direct rays of the sun approach the equator, while the mass of earth influenced by direct rays of the sun parallel with the ecliptic, falling upon any portion of the earth's surface in the northern hemisphere, will continually grow deeper and consequently portions of the earth reciprocal with the sun will increase in heat-producing power. It will be seen that such conditions continue all the while the sun's rays travel northward, which continue each year from December 22nd to June 21st. Thus over all portions of the northern hemisphere on December 22nd the sun's rays have least heat-producing power of any season of the year. After such period the sun's rays begin to travel northward as the earth progresses southward in its orbit until June 21st, when the sun has apparently reached its extreme northern limit upon the surface of the

earth, while the earth has reached its farthest limit southward in its orbit, and the heat-producing power of the northern hemisphere of the earth in contact with the sun's rays has reached its maximum and greatest depth of the earth's mass. Yet the heat will be felt upon the northern hemisphere of the earth as being stronger during the subsequent months of July and August and the first part of September, yet that condition is due to the increase in the intesity of the heat already produced as well as being produced, rather than to the increased heat-producing power of the earth's mass, which in fact, after June 21st, constantly diminishes until the following December 22nd.

The same conditions exist for the southern hemisphere, but June 21st must be considered as the period of least heat-producing power and December 22nd as the period of greatest heat-producing power of the earth's mass in contact with the sun's rays. Thus June 21st is to the southern hemisphere what December 22nd is to the northern hemisphere, with respect to the heat-producing power of the earth's mass influenced throughout the southern hemisphere by direct contact with the sun's rays.

It will be noticed that the variation in the depth of the earth's mass influenced by the sun's rays, increases from the equator toward the poles in each hemisphere of the earth.

Plate X. Plate ten is designed to illustrate the influence of the sun and moon upon the raising of the earth's sub-surface moisture to the roots of vegetation and to augment the clouds and general rainfall of any region of the earth, and to illustrate the reason why rainfall follows the persistent work of the settler upon arid regions of the earth's surface, consequently illustrates why it is true that "Rainfall follows civilization."

In Section A a mountain region of the earth is represented, where snow falls upon the mountain tops and melting flows upon Section B, where it may become a sub-surface stream by percolating through the sands of the desert. It is also true that moisture may be raised by the same force from levels of the ocean bed through overlying strata of earth and rocks to the neutral point shown by the line formed by the meeting of the solar and terrestrial electrical forces, as shown by the direction of the arrows.

In Section B, the soil is represented as having become heated for long periods of time, which has permitted the solar electrical force to penetrate the surface of the soil, meeting the terrestrial electrical force below the surface of the soil. The solar electrical force attracts both the terrestrial force and the sub-surface moisture, which the terrestrial electrical force brings with it to meet the solar electrical force. Thus the sub-surface moisture is raised on the principle of capillary attraction, the solar electrical force having an attraction for the sub-surface moisture and its contained terrestrial electrical force, just the same as it does for the waters of the sea to produce the tides. It is conceded that the moon exerts a like attractive influence for the sub-surface moisture, through its positive surface, from which the solar electro-vital force is transmitted from the moon to the earth.

It will be seen that when these two forces meet that a neutral point is established at the point where the terrestrial electrical affinity becomes satisfied for the solar electro-vital force. At the neutral point, the mutual affinities becoming satisfied, the moisture becomes deposited at that point, where it may supply the roots of vegetation, if any, at that point. But, in Section B, the neutral point occurs below the surface at a depth to which no roots can reach, hence the surface remains dry and parched. In Section C, the surface of the soil is represented as having been brought under a state of cultivation by the persistent effort of the settler. In so doing he has broken the soil and pulverized the surface soil, which has resulted in breaking the force of the sun's electrical force and caused it to stop at that line, by such local disturbance of the surface soil. During the period that the sun's electrical force is thus checked, its attractive force for the earth's electrical force and the subterranean moisture still remains, which causes the subterranean electrical force to rise, bringing its moisture by capillary attraction to this point of breakage. But in so doing the moisture comes in contact with seed sown and the heat produced at such points of union combines to produce the germination of seed and to produce plant growth. After the plants have grown sufficiently to produce a foliage then the foliage acts on the same principle as the forest, to insulate the sun's rays and to further cause the subterranean moisture to continue to be brought to such point of electrical union, which constitutes the neutral point between the two electrical flows.

Section D denotes a forest, or plants growing with an extensive foliage. The influence is explained in the body of this work. Section E denotes a plain in normal cultivation where the ground has been repeatedly stirred, breaking the solar current at the surface and causing the moisture to rise to the line of the roots of growing plants, to enhance their growth. Section F denotes the influence of cloudy weather and why lightnings play at the points of union of the two electrical currents. Section G is designed to illustrate the influence of extremely wet weather, in which the humidity of the atmosphere and the rising moisture serve to carry the neutral point above the roots and at many times above the surface soil and even at times above the foliage of growing vegetation. As the neutral point is the point in which the solar and the terrestrial electrical currents meet to produce germination and growth of vegetation cells, therefore by raising the neutral point above the roots and even above the foliage of vegetation, all vegetation is robbed of the vital stimulus necessary to produce growth and multiplication of cells, consequently, if such conditions remain for sufficient time the vegetation thus influenced will begin to decline and wane away as vitality leaves, resulting in all stages from vegetable injury and stunted growth, even to death of plant life within such area. Thus it will be seen that in order for plants to thrive the neutral point must be kept within the plant at some point, preferably near the level of the roots. In that way the plants receive vital stimulation and nourishment both from the sun and earth to enable the vital element within the vegetation cells to utilize the nourishment thus afforded. Thus, if soil is inclined to be too wet, thorough drainage assists to lower the neutral point to the seed sown, to germinate the seed and stimulate growth within the plant. But if the soil is inclined to be too dry, then much persistent surface stirring assists to check the solar electrical current and to bring the terrestrial electrical current, with its contained sub-surface moisture, to the surface or point of breakage, where the neutral point becomes established and sub-surface moisture becomes deposited to assist seed sown and planted within such surface soil to germinate and grow, throwing down roots to gather the moisture and terrestrial nourishment, while throwing upward blades to gather in the solar electro-vital force to further nourish the plant and to stimulate vegetable growth. The foliage assists to break the force of the solar current and, if of sufficient amount to entirely cover the surface soil, will assist to produce and maintain similar solar electrical breakage that surface stirring did before seeding the soil and in so doing the foliage retains the neutral point within the area of the plant, whereby the plant is enabled to gain sub-surface moisture and receive vital stimulation necessary to plant growth and maturity, through the mutual action of both the terrestrial and solar electrical forces.

Plate XI. Plate eleven is designed to illustrate the movement of the moon around the earth.

The plane of the moon's orbit crosses the plane of the earth's orbit at an angle of 5°8′48″. If a line were revolved through the center of the moon perpendicular to the line connecting the center of the moon with the center of the sun, then such line would outline the limit of solar illumination upon the moon's surface. The portion of the moon's surface opposite from the sun is shown as shaded, to indicate that such portion of the moon's surface is not illuminated by the sun. The light portion of the moon's surface is shown as illuminated. Dotted lines are drawn from the figure of the sun tangent to the figure of the moon's surface to indicate the limit of solar illumination upon the moon's surface.

If a line were revolved through the center of the moon perpendicular to a line connecting the center of the earth and the center of the moon, such line would outline the area of vision upon the moon's surface to an observer upon the earth's surface. Lines drawn tangent to the area of vision from the center of the earth would outline the field of vision to an observer upon the earth. Dotted lines drawn from the figure of the earth to the figure of the moon indicate the limit of the field of vision of the moon from the earth.

Dotted lines drawn from the figure of the moon to the left indicate celestial radii passing through the moon from pole to pole.

Plate XII. Plate twelve is designed to illustrate the application of electro-vital force upon both the earth and moon to produce the diurnal movements of the earth and the movement of the moon around the earth throughout its entire orbit as well. The observer is supposed to view the earth from a position to the north and over the earth along a plane embracing the zenith line between the sun and earth.

The electrical quadrants of the earth are shown as in plate four. Quadrant one being negative, embraces that portion of the earth's surface covered by the sun's rays from 6 A. M. to 12 M.; quadrant two, electrically positive, embraces that portion of the earth's surface covered by the sun's rays from 12 M. to 6 P. M.; quadrant three, electrically positive embraces that portion of the earth's surface lying east of the second quadrant and shaded by the earth from the sun, to the zenith plane, embracing that portion of the earth covered by the first portion of the night from 6 P. M. to 12 P. M.; quadrant four, electrically negative, embraces that portion of the earth covered by the shadow of the earth during the second portion of the night and covered from 12 P. M. to 6 A. M.

At the position of the new moon the shaded side of the moon faces the earth, and is caused to advance in its orbit by the repelling force of the negative first quadrant of the earth and the repelling force of the positive sun against the positive receding border of the moon's sunset, while its movement is further facilitated by the pulling force of the second positive quadrant of the earth for the negative surface of the moon and the pulling force of the positive sun for the negative advancing border along the line of sunrise to the moon's surface. The arrows indicate the application of force upon the moon's surface. By noting the points indicated by the arrows and observing the positions from which they emanate and to which they point and the electrical state of such positions, as well as the electrical state of the moon's surface and that of the earth's surface, bearing in mind that the solar illuminated surface of the moon is always positive, while the sun is always positive and the earth's surface passing through the positions of quadrants two and three is always positive and remembering that the shaded portion of the moon from the sun is always negative as well as the earth's surface passing through the positions of quadrants four and one is always negative, one can then easily determine from the diagram the application of the force as indicated by the arrows, remembering that like electrical states repel and unlike electrical states attract each other.

It will be observed that the electrical states of the moon's surface change according to the change in its solar illumination, which constantly changes as the moon' revolves around the earth, while the electrical states of the earth are always the same, relative to the same position to the sun, yet the diurnal movement of the earth produces a constant change upon the earth's surface, giving an advancing negative and a positive receding illuminated surface to the sun. It will be observed that these forces apply to the moon to propel it around the earth throughout its entire orbit.

Plate XIII. Plate thirteen should be numbered plate fourteen and plate fourteen should be numbered plate thirteen. Plate thirteen is designed to illustrate the writer's idea of how remote planets from the sun may revolve in secondary orbit, giving to such planets seasons of sufficiently short duration to render portions of their surfaces and their satellites inhabitable. Another purpose of plate thirteen is to illustrate the possible cause for the apparent retrograde movement of the major planets, especially those at great distances from the sun.

It will be seen that the planet revolves within its secondary orbit around a line erected through the center of the sun perpendicular to the celestial radius passing through the center of the sun. The planet is influenced electrically similarly to the earth in making its annual revolution around the sun. It is assumed that the southern hemisphere of all planets is less dense than the northern hemisphere and due to the same cause that has produced the difference in the density of the hemispheres of the earth. Such being true, then the difference in the rate of electrical change within each hemisphere of the planet will produce a variation in the arcs of the orbit of the planet, giving the orbit an elliptical curve with the greater arc south of the plane passing through the equinoctial points, while the lesser arc lies to the north of such a plane. It will be seen that the eastward progression made by the planet while passing through its greater or southern arc will exceed the westward retrogression made by the planet while passing through its lesser or northern arc. This difference will give to the planet a general eastward progress upon the primary arc during each revolution around its secondary orbit. The amount of progress thus made by the planet will determine the distance made upon the primary orbit each yearly revolution of the planet through its secondary orbit. This progress is designated by the cross lines upon the primary orbit and shown by the letters a, b, c, d, e, f, g, h, i, j, etc., entirely around the primary orbit, the number of such periods denoting the number of times or annual revolutions made by the planet around its secondary orbit in making one great revolution around the sun. It is presumed that each major planet carries with it by its attractive preponderance over that of the sun all satellites that may be contained within its area of prevailing attractive influence as shown in Plate XIV, Section One. It will be seen that the westward movement made by a major planet in traversing its secondary orbit will account for the apparent retrograde movement made by such heavenly bodies of the solar system as has been observed to exist and to account for which scientists have supposed that the movement of the earth in its orbit has made the change that becomes apparent in viewing such distant heavenly body, when, in fact, according to the views of the writer, the retrograde movement of distant heavenly bodies of the solar system, as the major planets, is real rather than apparent.

Plate XIV. Plate fourteen is divided into two sections. Section one is designed to illustrate the relative areas of the prevailing attractive influence surrounding the planets Mercury, Venus, Earth and Mars. The more distant planets require such great distances as to forbid them being represented upon so small a plate. (See table giving distances.) The areas representing the circles of the sun and the dots for the planets are not drawn according to their relative dimensions. But the distance from the center of the sun to the limit of the circle around the dot representing the planets is supposed to represent the relative length of the radius of the spherical volume of prevailing attractive influence of the sun over the planets, while from the limit of the circle surrounding the dot representing each planet to the center of the dot is supposed to represent the relative length of the radius of the spherical volume extending from the center of each planet respectively to the limit of the circle surrounding

each planet, wherein the planet has the prevailing attractive influence over all forces and material objects existing within such space. Hence it is that each planet will exercise the controlling influence over all satellites existing within the radius designating the distance from the planet's center in which it exercises the prevailing attractive influence over the sun and all other heavenly bodies as well.

Section one is designed with the idea that all heavenly bodies attract electro-vital force and exercise the prevailing attractive influence over all other heavenly bodies for a distance from their respective centers proportional to the volume of their respective masses when all such masses have been reduced to a common density.

Section two is designed to illustrate the manner in which any planet is attracted by the sun and the area over which such attraction is exerted in reaching a planet. It will be seen that an area of cylindrical volume, with a diameter equal to the planet, influences the same sized area upon the sun's surface. As the force is supposed to become exerted along straight lines connecting the planet with the sun, it will be seen that the full force of the sun's mass contained with such cylindrical area extending entirely through the sun's mass, will be exerted upon the planet, while all other portions of the sun's mass will not become influenced by such planet, but may become influenced by other planets and minor bodies of the solar system, existing along lines contained without lines included within such cylindrical volume, as shown extending from the planet through the sun's mass. Lines are drawn upon the cut representing the sun's mass, to indicate the solar equatorial belt influenced by known planets of the solar system, as indicated in the cut.

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